

**WAC 296-62-07709 Exposure monitoring. (1) General.**

(a) Each employer shall perform monitoring to determine accurately the airborne concentrations of asbestos to which employees may be exposed.

(b) Determinations of employee exposure shall be made from breathing zone air samples that are representative of the eight-hour TWA and fifteen minute short-term exposures of each employee.

(c) Representative eight-hour TWA employee exposures shall be determined on the basis of one or more samples representing full-shift exposures for each shift for each employee in each job classification in each work area.

(d) Representative fifteen minute short term employee exposures shall be determined on the basis of one or more samples representing fifteen minute exposures associated with operations that are most likely to produce exposures above the excursion limit for each shift for each job classification in each work area.

(e) Prior to the start of the removal, demolition, or renovation project, representative area monitoring shall be conducted for later use (see WAC 296-62-07713 (2)(c)).

**(2) Initial monitoring.**

(a) Each employer who has a workplace or work operation covered by this standard, except as provided for in (b) and (c) of this subsection, shall perform initial monitoring of employees who are, or may reasonably be expected to be exposed to airborne concentrations at or above the action level and/or excursion limit. The initial monitoring shall be at the initiation of each asbestos job to accurately determine the airborne concentration of asbestos to which employees may be exposed.

(b) Where the employer or his/her representative has monitored after December 20, 1985, the monitoring satisfies all other requirements of this section, and the monitoring data was obtained during work operations conducted under workplace conditions closely resembling the processes, type of material including percentage of asbestos, control methods, work practices, and environmental conditions used and prevailing in the employer's current operations, the employer may rely on such earlier monitoring results to satisfy the requirements of (a) of this subsection, except for employees engaged in removal, demolition, or renovation operations using negative-pressure enclosures as required by WAC 296-62-07712.

(c) Where the employer has relied upon objective data that demonstrates that asbestos is not capable of being released in airborne concentrations at or above the action level and/or excursion limit under those work conditions of processing, use, or handling expected to have the greatest potential for releasing asbestos, then no initial monitoring is required.

(3) Monitoring frequency (periodic monitoring) and patterns. After the initial determinations required by subsection (2)(a) of this section, samples shall be of such frequency and pattern as to represent with reasonable accuracy the levels of exposure of the employees.

(a) In no case shall sampling be at intervals greater than six months for employees whose exposures may reasonably be foreseen to exceed the action level and/or excursion limit.

(b) Daily monitoring within regulated areas: The employer shall conduct daily monitoring that is representative of the exposure of each employee who is assigned to work within a regulated area. Exception: When all employees within a regulated area are equipped with full facepiece supplied-air respirators operated in the pressure-demand mode equipped with either an auxiliary positive pressure self-contained breathing apparatus or a HEPA filter, the employer may dispense with the daily monitoring required by this subsection.

(c) Monitoring outside negative-pressure enclosures: The employer shall conduct representative area monitoring of the airborne fiber levels at least every other day at the HEPA machine exhaust and entrance to the decontamination area.

(4) Changes in monitoring frequency. If either the initial or the periodic monitoring required by subsections (2) and (3) of this section statistically indicates that employee exposures are below the action level and/or excursion limit, the employer may discontinue the monitoring for those employees whose exposures are represented by such monitoring.

(5) Additional monitoring. Notwithstanding the provisions of subsections (2)(b) and (4) of this section, the employer shall institute the exposure monitoring required under subsections (2)(a) and (3) of this section whenever there has been a change in the production, process, control equipment, personnel, or work practices that may result in new or additional exposures above the action level and/or excursion limit, or when the employer has any reason to suspect that a change may result in new or additional exposures above the action level and/or excursion limit.

**(6) Method of monitoring.**

(a) All samples taken to satisfy the monitoring requirements of this section shall be personal samples collected following the procedures specified in WAC 296-62-07735, Appendix A.

(b) Monitoring shall be performed by persons having a thorough understanding of monitoring principles and procedures and who can demonstrate proficiency in sampling techniques.

(c) All samples taken to satisfy the monitoring requirements of this section shall be evaluated using the WISHA reference method specified in WAC 296-62-07735, Appendix A, or an equivalent counting method recognized by the department.

(d) If an equivalent method to the WISHA reference method is used, the employer shall ensure that the method meets the following criteria:

(i) Replicate exposure data used to establish equivalency are collected in side-by-side field and laboratory comparisons;

(ii) The comparison indicates that ninety percent of the samples collected in the range 0.1 to 0.4 f/cc have an accuracy range of plus or minus twenty-five percent of the WISHA reference method results with a ninety-

five percent confidence level as demonstrated by a statistically valid protocol; and

(iii) The equivalent method is documented and the results of the comparison testing are maintained.

(e) To satisfy the monitoring requirements of this section, employers must use the results of monitoring analysis performed by laboratories which have instituted quality assurance programs that include the elements as prescribed in WAC 296-62-07735, Appendix A.

(7) Employee notification of monitoring results.

(a) The employer shall, as soon as possible but no later than fifteen working days after the receipt of the results of any monitoring performed under the standard, notify the affected employees of these results in writing either individually or by posting of results in an appropriate location that is accessible to affected employees.

(b) The written notification required by (a) of this subsection shall contain the corrective action being taken by the employer to reduce employee exposure to or below the permissible exposure limits, wherever monitoring results indicated that the permissible exposure limits have been exceeded.

(8) Observation of monitoring.

(a) The employer shall provide affected employees or their designated representatives an opportunity to observe any monitoring of employee exposure to asbestos conducted in accordance with this section.

(b) When observation of the monitoring of employee exposure to asbestos requires entry into an area where the use of protective clothing or equipment is required, the observer shall be provided with and be required to use such clothing and equipment and shall comply with all other applicable safety and health procedures.

[Statutory Authority: Chapter 49.17 RCW. 89-11-035 (Order 89-03), § 296-62-07709, filed 5/15/89, effective 6/30/89; 87-24-051 (Order 87-24), § 296-62-07709, filed 11/30/87. Statutory Authority: RCW 49.17.050(2) and 49.17.040. 87-10-008 (Order 87-06), § 296-62-07709, filed 4/27/87.]

**WAC 296-62-07711 Regulated areas.** (1) General. The employer shall establish a regulated area in work areas where airborne concentrations of asbestos exceed or can reasonably be expected to exceed the permissible exposure limits prescribed in WAC 296-62-07705.

(2) Demarcation. The regulated area shall be demarcated in any manner that minimizes the number of persons within the area and protects persons outside the area from exposure to airborne concentrations of asbestos in excess of the permissible exposure limits.

(3) Access. Access to regulated areas shall be limited to authorized persons or to persons authorized by the Washington Industrial Safety and Health Act or regulations issued pursuant thereto.

(4) Provision of respirators. Each person entering a regulated area shall be supplied with and required to use a respirator, selected in accordance with WAC 296-62-07715.

(5) Protective clothing. All persons entering a regulated area shall be supplied with and required to wear protective clothing, selected in accordance with WAC 296-62-07717.

(6) Prohibited activities. The employer shall ensure that employees do not eat, drink, smoke, chew tobacco or gum, or apply cosmetics in the regulated areas.

(7) Confined space. The employer shall determine if a confined space hazard exists and shall take any necessary precautions in accordance with chapter 296-62 WAC.

[Statutory Authority: Chapter 49.17 RCW. 89-11-035 (Order 89-03), § 296-62-07711, filed 5/15/89, effective 6/30/89; 87-24-051 (Order 87-24), § 296-62-07711, filed 11/30/87. Statutory Authority: RCW 49.17.050(2) and 49.17.040. 87-10-008 (Order 87-06), § 296-62-07711, filed 4/27/87.]

**WAC 296-62-07712 Requirements for asbestos removal, demolition, and renovation operations.** (1) The employer, wherever feasible, shall establish negative-pressure enclosures having a minimum of one air exchange every fifteen minutes within the enclosure before commencing removal, demolition, and renovation operations. A sufficient amount of air shall be exhausted to create a pressure of -0.02 inches of water within the enclosure with respect to the area outside the enclosure.

(2) The employer shall designate a certified asbestos supervisor who shall perform or directly supervise the following duties:

(a) Set up the enclosure;

(b) Ensure the integrity of the enclosure;

(c) Control entry to and exit from the enclosure;

(d) Supervise all employee exposure monitoring required by this section;

(e) Ensure that employees working within the enclosure wear protective clothing and respirators as required by WAC 296-62-07715 and 296-62-07717;

(f) Ensure that employees are trained in the use of engineering controls, work practices, and personal protective equipment;

(g) Ensure that employees use the hygiene facilities and observe the decontamination procedures specified in WAC 296-62-07719; and

(h) Ensure that engineering controls including HEPA filters are functioning properly.

(3) In addition to the qualifications specified in WAC 296-62-07703, the certified asbestos supervisor shall be trained in all aspects of asbestos abatement, the contents of this standard, the identification of asbestos and their removal procedures, and other practices for reducing the hazard. Such training shall be obtained in a comprehensive course conducted by an approved asbestos supervisor course as specified in WAC 296-65-007. The certified asbestos supervisor shall meet all requirements as specified in WAC 296-65-012.

(4) Exceptions:

(a) For small-scale, short-duration operations, such as pipe repair, valve replacement, installing electrical conduits, installing or removing drywall, roofing, and other general building maintenance or renovation, the employer is not required to comply with the requirements of WAC 296-62-07712(1). Employers wishing to take advantage of the exemption in this subsection shall comply with WAC 296-62-07753, Appendix J.



(b) A certified asbestos supervisor shall not be required for projects consisting of less than 48 square feet or 10 lineal feet of asbestos-containing material.

[Statutory Authority: Chapter 49.17 RCW. 89-21-018 (Order 89-10), § 296-62-07712, filed 10/10/89, effective 11/24/89; 89-11-035 (Order 89-03), § 296-62-07712, filed 5/15/89, effective 6/30/89; 87-24-051 (Order 87-24), § 296-62-07712, filed 11/30/87.]

**WAC 296-62-07713 Methods of compliance. (1) Engineering controls and work practices.**

(a) The employer shall institute engineering controls and work practices to reduce and maintain employee exposure to or below the permissible exposure limits prescribed in WAC 296-62-07705, except to the extent that such controls are not feasible. Engineering controls and work practices include but are not limited to the following:

(i) Local exhaust ventilation equipped with HEPA filter dust collection systems;

(ii) Vacuum cleaners equipped with HEPA filters;

(iii) Enclosure or isolation of processes producing asbestos dust;

(iv) Use of wet methods, wetting agents, or removal encapsulants to control employee exposures during asbestos handling, mixing, removal, cutting, application, and cleanup;

(v) Prompt disposal of wastes contaminated with asbestos in leak-tight containers; or

(vi) Use of work practices or other engineering controls that the director can show to be feasible.

(b) Wherever the feasible engineering controls and work practices that can be instituted are not sufficient to reduce employee exposure to or below the permissible exposure limits prescribed in WAC 296-62-07705, the employer shall use them to reduce employee exposure to the lowest levels achievable by these controls and shall supplement them by the use of respiratory protection that complies with the requirements of WAC 296-62-07715.

(c) For the following operations, wherever feasible engineering controls and work practices that can be instituted are not sufficient to reduce the employee exposure to or below the permissible exposure limits prescribed in WAC 296-62-07705, the employer shall use them to reduce employee exposure to or below 0.5 fiber per cubic centimeter of air (as an eight-hour time-weighted average) and shall supplement them by the use of any combination of respiratory protection that complies with the requirements of WAC 296-62-07715, work practices and feasible engineering controls that will reduce employee exposure to or below the permissible exposure limits prescribed in WAC 296-62-07705: Coupling cutoff in primary asbestos cement pipe manufacturing; sanding in primary and secondary asbestos cement sheet manufacturing; grinding in primary and secondary friction product manufacturing; carding and spinning in dry textile processes; and grinding and sanding in primary plastics manufacturing.

(d) Local exhaust ventilation. Local exhaust ventilation and dust collection systems shall be designed, constructed, installed, and maintained in accordance with

good practices such as those found in the American National Standard Fundamentals Governing the Design and Operation of Local Exhaust Systems, ANSI Z9.2-1979.

(e) Particular tools. All hand-operated and power-operated tools which would produce or release fibers of asbestos so as to expose employees to levels in excess of the exposure limits prescribed in WAC 296-62-07705, such as, but not limited to, saws, scorers, abrasive wheels, and drills, shall be provided with local exhaust ventilation systems which comply with (d) of this subsection. High-speed abrasive disc saws that are not equipped with appropriate engineering controls shall not be used for work related to asbestos.

(f) Wet methods. Asbestos shall be handled, mixed, applied, removed, cut, scored, or otherwise worked in a wet saturated state to prevent the emission of airborne fibers unless the usefulness of the product would be diminished thereby.

(g) Materials containing asbestos shall not be applied by spray methods unless the materials contain less than 0.1% asbestos by weight, the asbestos is a natural contaminant and objective data indicate employee exposure will not exceed the action level of 0.1 f/cc.

(h) Particular products and operations. No asbestos cement, mortar, coating, grout, plaster, or similar material containing asbestos shall be removed from bags, cartons, or other containers in which they are shipped, without being either wetted, enclosed, or ventilated so as to prevent effectively the release of airborne fibers of asbestos so as to expose employees to levels in excess of the permissible exposure limits prescribed in WAC 296-62-07705.

(i) Compressed air. Compressed air shall not be used to remove asbestos or materials containing asbestos unless the compressed air is used in conjunction with an enclosed ventilation system designed to capture the dust cloud created by the compressed air.

(2) Clean-up.

(a) After completion of asbestos removal, demolition, and renovation operations, all surfaces in and around the work area shall be cleared of any asbestos debris.

(b) Lock-down. Where asbestos has been removed, encapsulant shall be applied to ensure binding of remaining fibers.

(c) The employer shall demonstrate by monitoring that the airborne fiber concentration is below the action level; or, at or below the airborne fiber level existing prior to the start of the removal, demolition, or renovation project; whichever level is lower.

(3) Compliance program.

(a) Where either the time weighted average and/or excursion limit is exceeded, the employer shall establish and implement a written program to reduce employee exposure to or below the permissible exposure limits by means of engineering and work practice controls as required by subsection (1) of this section, and by the use of respiratory protection where required or permitted under this section.

(b) Such programs shall be reviewed and updated as necessary to reflect significant changes in the status of the employer's compliance program.

(c) Written programs shall be submitted upon request for examination and copying to the director, affected employees and designated employee representatives.

(d) The employer shall not use employee rotation as a means of compliance with the permissible exposure limits specified in WAC 296-62-07705.

[Statutory Authority: Chapter 49.17 RCW. 89-11-035 (Order 89-03), § 296-62-07713, filed 5/15/89, effective 6/30/89; 87-24-051 (Order 87-24), § 296-62-07713, filed 11/30/87. Statutory Authority: RCW 49.17.050(2) and 49.17.040. 87-10-008 (Order 87-06), § 296-62-07713, filed 4/27/87.]

**WAC 296-62-07715 Respiratory protection.** (1) General. The employer shall provide respirators, and ensure that they are used, where required by WAC 296-62-077 through 296-62-07753. Respirators shall be used in the following circumstances:

(a) During the interval necessary to install or implement feasible engineering and work practice controls;

(b) In work operations, such as maintenance and repair activities, or other activities for which engineering and work practice controls are not feasible;

(c) In work situations where feasible engineering and work practice controls are not yet sufficient to reduce exposure to or below the permissible exposure limits;

(d) In emergencies;

(e) In all regulated areas; and

(f) Whenever employee exposure exceeds the permissible exposure limits.

(2) Respirator selection.

(a) Where respirators are required under this section, the employer shall select and provide at no cost to the employee, the appropriate respirator as specified in Table 1 of this section and shall ensure that the employee uses the respirator provided. The employer shall select respirators from among those approved as being acceptable for protection by the Mine Safety and Health Administration (MSHA) or by the National Institute for Occupational Safety and Health (NIOSH) under the provisions of 30 CFR Part 11.

(b) The employer shall provide a powered, air-purifying respirator in lieu of any negative pressure respirator specified in Table 1 of this section whenever:

(i) An employee chooses to use this type of respirator; and

(ii) This respirator will provide adequate protection to the employee.

TABLE 1—RESPIRATORY PROTECTION FOR ASBESTOS FIBERS

Concentration of asbestos fibers	Required Respirator <sup>a</sup>
Not in excess of 2 f/cc.	1. Half-mask, air-purifying respirator, other than a disposable respirator, equipped with high-efficiency filters.
Not in excess of 10 f/cc.	1. Full facepiece air-purifying respirator equipped with high-efficiency filters.

(1989 Ed.)

Concentration of asbestos fibers	Required Respirator <sup>a</sup>
Not in excess of 20 f/cc.	1. Any powered air-purifying respirator equipped with high-efficiency filters. 2. Any supplied-air respirator operated in continuous flow mode.
Not in excess of 200 f/cc.	1. Full facepiece supplied-air respirator operated in pressure demand mode.
Greater than 200 f/cc or unknown concentration.	1. Full facepiece supplied-air respirator operated in pressure-demand mode equipped with either an auxiliary positive pressure self-contained breathing apparatus or a HEPA filter. <sup>c</sup> 2. Full facepiece positive-pressure self-contained breathing apparatus (SCBA).

Note: a. Respirators assigned for higher environmental concentrations may be used at lower concentrations.

b. A high-efficiency filter means a filter that is capable of trapping and retaining at least 99.97 percent of all monodispersed particles of 0.3 micrometers mean aerodynamic diameter or larger.

c. See subsection (5)(c) of this section for fit testing requirements.

(3) Special respiratory protection requirements. Unless specifically identified in this subsection, respirator selection for asbestos removal, demolition, and renovation operations shall be in accordance with Table 1 of subsection (2) of this section. The employer shall provide and require to be worn, at no cost to the employee, a full facepiece supplied-air respirator operated in the pressure demand mode equipped with either an auxiliary positive pressure self-contained breathing apparatus or a HEPA filter to employees engaged in the following asbestos operations:

(a) Inside negative pressure enclosures used for removal, demolition, and renovation of friable asbestos from walls, ceilings, vessels, ventilation ducts, elevator shafts, and other structural members, but does not include pipes or piping systems; or

(b) Any dry removal of asbestos.

(4) Respirator program.

(a) Where respiratory protection is required, the employer shall institute a respirator program in accordance with WAC 296-62-071.

(b) The employer shall permit each employee who uses a filter respirator to change the filter elements whenever an increase in breathing resistance is detected and shall maintain an adequate supply of filter elements for this purpose.

(c) Employees who wear respirators shall be permitted to leave work areas to wash their faces and respirator facepieces whenever necessary to prevent skin irritation associated with respirator use.

(d) No employee shall be assigned to tasks requiring the use of respirators if, based upon his or her most recent examination, an examining physician determines that the employee will be unable to function normally wearing a respirator, or that the safety or health of the employee or other employees will be impaired by the use

of a respirator. Such employee shall be assigned to another job or given the opportunity to transfer to a different position whose duties he or she is able to perform with the same employer, in the same geographical area and with the same seniority, status, and rate of pay the employee had just prior to such transfer, if such a different position is available.

(5) Respirator fit testing.

(a) The employer shall ensure that the respirator issued to the employee exhibits the least possible facepiece leakage and that the respirator is fitted properly.

(b) For each employee wearing negative pressure respirators, employers shall perform either quantitative or qualitative face fit tests at the time of initial fitting and at least every six months thereafter. The qualitative fit tests may be used only for testing the fit of half-mask respirators to be worn in concentrations of asbestos not in excess of 2 f/cc, and shall be conducted in accordance with WAC 296-62-07739, Appendix C. The tests shall be used to select facepieces that provide the required protection as prescribed in Table 1 of this section.

(c) Any supplied-air respirator facepiece equipped with a back-up HEPA filter shall be quantitatively fit tested with the air supply disconnected at the time of initial fitting and at least every six months thereafter. The quantitative fit tests shall be conducted using the procedures described in WAC 296-62-07739(2), Appendix C, for negative pressure respirators.

[Statutory Authority: Chapter 49.17 RCW. 89-11-035 (Order 89-03), § 296-62-07715, filed 5/15/89, effective 6/30/89; 87-24-051 (Order 87-24), § 296-62-07715, filed 11/30/87. Statutory Authority: RCW 49.17.050(2) and 49.17.040. 87-10-008 (Order 87-06), § 296-62-07715, filed 4/27/87.]

**WAC 296-62-07717 Protective work clothing and equipment.** (1) Provision and use. If an employee is exposed to asbestos above the permissible exposure limits, or where the possibility of eye irritation exists, the employer shall provide at no cost to the employee and ensure that the employee uses appropriate protective work clothing and equipment such as, but not limited to:

(a) Coveralls or similar full-body work clothing;

(b) Gloves, head coverings, and foot coverings; and

(c) Face shields, vented goggles, or other appropriate protective equipment which complies with WAC 296-24-07801.

(2) Removal and storage.

(a) The employer shall ensure that employees remove work clothing contaminated with asbestos only in change rooms provided in accordance with WAC 296-62-07719(1).

(b) The employer shall ensure that no employee takes contaminated work clothing out of the change room, except those employees authorized to do so for the purpose of laundering, maintenance, or disposal.

(c) Contaminated work clothing shall be placed and stored in closed containers which prevent dispersion of the asbestos outside the container.

(d) Containers of contaminated protective devices or work clothing which are to be taken out of change rooms or the workplace for cleaning, maintenance, or disposal,

shall bear labels in accordance with WAC 296-62-07721(2).

(3) Cleaning and replacement.

(a) The employer shall clean, launder, repair, or replace protective clothing and equipment required by this paragraph to maintain their effectiveness. The employer shall provide clean protective clothing and equipment at least weekly to each affected employee.

(b) The employer shall prohibit the removal of asbestos from protective clothing and equipment by blowing or shaking.

(c) Laundering of contaminated clothing shall be done so as to prevent the release of airborne fibers of asbestos in excess of the permissible exposure limits prescribed in WAC 296-62-07705.

(d) Any employer who gives contaminated clothing to another person for laundering shall inform such person of the requirement in (c) of this subsection to effectively prevent the release of airborne fibers of asbestos in excess of the permissible exposure limits.

(e) The employer shall inform any person who launders or cleans protective clothing or equipment contaminated with asbestos of the potentially harmful effects of exposure to asbestos.

(f) Contaminated clothing shall be transported in sealed impermeable bags, or other closed, impermeable containers, and labeled in accordance with WAC 296-62-07721.

(4) Protective clothing for removal, demolition, and renovation operations.

(a) The competent person shall periodically examine worksuits worn by employees for rips or tears that may occur during performance of work.

(b) When rips or tears are detected while an employee is working within a negative-pressure enclosure, rips and tears shall be immediately mended, or the worksuit shall be immediately replaced.

[Statutory Authority: Chapter 49.17 RCW. 89-11-035 (Order 89-03), § 296-62-07717, filed 5/15/89, effective 6/30/89; 87-24-051 (Order 87-24), § 296-62-07717, filed 11/30/87. Statutory Authority: RCW 49.17.050(2) and 49.17.040. 87-10-008 (Order 87-06), § 296-62-07717, filed 4/27/87.]

**WAC 296-62-07719 Hygiene facilities and practices.** (1) Change rooms.

(a) The employer shall provide clean change rooms for employees required to work in regulated areas or required by WAC 296-62-07717(1) to wear protective clothing.

Exception: In lieu of the change area requirement specified in this subsection, the employer may permit employees in small-scale, short-duration operations, as described in WAC 296-62-07712(4), to clean their protective clothing with a portable HEPA-equipped vacuum before such employees leave the area where maintenance was performed.

(b) The employer shall ensure that change rooms are in accordance with WAC 296-24-120, and are equipped with two separate lockers or storage facilities, so separated as to prevent contamination of the employee's street clothes from his/her protective work clothing and equipment.

(2) Showers.

(a) The employer shall ensure that employees who work in negative pressure enclosures required by WAC 296-62-07712, or who work in areas where their airborne exposure is above the permissible exposure limits prescribed in WAC 296-62-07705, shower at the end of the work shift.

(b) The employer shall provide shower facilities which comply with WAC 296-24-12009(3).

(c) The employer shall ensure that employees who are required to shower pursuant to (a) of this subsection do not leave the workplace wearing any clothing or equipment worn during the work shift.

(3) Special requirements for removal, demolition, and renovation operations.

(a) Decontamination area. Except for small-scale, short-duration operations, as described in WAC 296-62-07753 Appendix J, the employer shall establish a decontamination area that is adjacent and connected to the regulated area for the decontamination of employees contaminated with asbestos. The decontamination area shall consist of an equipment room, shower area, and clean room in series. The employer shall ensure that employees enter and exit the regulated area through the decontamination area.

(b) Clean room. The clean room shall be equipped with a locker or appropriate storage container for each employee's use.

(c) Shower area. Where feasible, shower facilities shall be provided which comply with WAC 296-24-12009(3). The showers shall be contiguous both to the equipment room and the clean change room, unless the employer can demonstrate that this location is not feasible. Where the employer can demonstrate that it is not feasible to locate the shower between the equipment room and the clean change room, the employer shall ensure that employees:

(i) Remove asbestos contamination from their worksuits using a HEPA vacuum before proceeding to a shower that is not contiguous to the work area; or

(ii) Remove their contaminated worksuits, don clean worksuits, and proceed to a shower that is not contiguous to the work area.

(d) Equipment room. The equipment room shall be supplied with impermeable, labeled bags and containers for the containment and disposal of contaminated protective clothing and equipment.

(e) Decontamination area entry procedures.

(i) The employer shall ensure that employees:

(A) Enter the decontamination area through the clean room;

(B) Remove and deposit street clothing within a locker provided for their use; and

(C) Put on protective clothing and respiratory protection before leaving the clean room.

(ii) Before entering the enclosure, the employer shall ensure that employees pass through the equipment room.

(f) Decontamination area exit procedures.

(i) Before leaving the regulated area, the employer shall ensure that employees remove all gross contamination and debris from their protective clothing.

(ii) The employer shall ensure that employees remove their protective clothing in the equipment room and deposit the clothing in labeled impermeable bags or containers.

(iii) The employer shall ensure that employees do not remove their respirators in the equipment room.

(iv) The employer shall ensure that employees shower prior to entering the clean room. When taking a shower, employees shall be fully wetted, including the face and hair, prior to removing their respirators.

(v) The employer shall ensure that, after showering, employees enter the clean room before changing into street clothes.

(g) Decontamination area for personnel shall not be used for the transportation of asbestos debris.

(h) Waste load-out procedure. The waste load-out area as required by WAC 296-62-07723(7) shall be used as an area for final preparation and external decontamination of waste containers, as a short term storage area for bagged waste, and as a port for transporting waste.

The employer shall ensure waste containers be free of all gross contaminated material before removal from the negative-pressure enclosure. Gross contamination shall be wiped, scraped off, or washed off containers before they are placed into a two chamber air lock which is adjacent to the negative-pressure enclosure. In the first chamber, the exterior of the waste container shall be decontaminated or placed within a second waste container, and then it shall be moved into the second chamber of the air lock for temporary storage or transferred outside of the regulated area. The second waste container shall not be reused unless thoroughly decontaminated.

(4) Lunchrooms.

(a) The employer shall provide lunchroom facilities for employees who work in areas where their airborne exposure is above the time weighted average and/or excursion limit.

(b) The employer shall ensure that lunchroom facilities have a positive pressure, filtered air supply, and are readily accessible to employees.

(c) The employer shall ensure that employees who work in areas where their airborne exposure is above the time weighted average and/or excursion limit, wash their hands and faces prior to eating, drinking, or smoking.

(d) The employer shall ensure that employees do not enter lunchroom facilities with protective work clothing or equipment unless surface asbestos fibers have been removed from the clothing or equipment by vacuuming or other method that removes dust without causing the asbestos to become airborne.

[Statutory Authority: Chapter 49.17 RCW. 89-11-035 (Order 89-03), § 296-62-07719, filed 5/15/89, effective 6/30/89; 87-24-051 (Order 87-24), § 296-62-07719, filed 11/30/87. Statutory Authority: RCW 49.17.050(2) and 49.17.040. 87-10-008 (Order 87-06), § 296-62-07719, filed 4/27/87.]

**WAC 296-62-07721 Communication of hazards to employees.** (1) Upon written or oral request, a copy of the written report required in WAC 296-62-07707 and 296-65-020 shall be given to the collective bargaining

representatives or employee representatives of any employee who may be exposed to any asbestos or asbestos-containing material. A copy of the written report shall be posted conspicuously at the location where employees report to work.

(2) Warning signs.

(a) Warning signs shall be provided and displayed at each regulated area. In addition, warning signs shall be posted at all approaches to regulated areas so that an employee may read the signs and take necessary protective steps before entering the area.

(b) The warning signs required by (a) of this subsection shall bear the following information:

DANGER  
ASBESTOS  
CANCER AND LUNG DISEASE HAZARD  
AUTHORIZED PERSONNEL ONLY  
RESPIRATORS AND PROTECTIVE CLOTHING ARE REQUIRED  
IN THIS AREA

(3) Warning labels.

(a) Warning labels shall be affixed to all products containing asbestos including raw materials, mixtures, scrap, waste, debris, and other products containing asbestos fibers, and to their containers including waste containers. Where feasible, installed asbestos products shall contain a visible label.

(b) Labels shall be printed in large, bold letters on a contrasting background.

(c) The labels shall comply with the requirements of WAC 296-62-05411, and shall include the following information:

DANGER  
CONTAINS ASBESTOS FIBERS  
AVOID CREATING DUST  
CANCER AND LUNG DISEASE HAZARD  
AVOID BREATHING AIRBORNE ASBESTOS FIBERS

(d) Where minerals to be labeled are only tremolite, anthophyllite, or actinolite, the employer may replace the term "asbestos" with the appropriate mineral name.

(4) Material safety data sheets. Employers who are manufacturers or importers of asbestos, or asbestos products shall comply with the requirements regarding development of material safety data sheets as specified in WAC 296-62-05413, except as provided by subsection (5) of this section.

(5) The provisions for labels required by subsection (3) of this section or for material safety data sheets required by subsection (4) of this section do not apply where:

(a) Asbestos fibers have been modified by a bonding agent, coating, binder, or other material, provided that the manufacturer can demonstrate that during any reasonably foreseeable use, handling, storage, disposal, processing, or transportation, no airborne concentrations of fibers of asbestos in excess of the action level and/or excursion limit will be released; or

(b) Asbestos is present in a product in concentrations less than 0.1 percent by weight.

(6) Employee information and training.

(a) The employer shall institute a training program for all employees who are exposed to airborne concentrations of asbestos at or above the action level and/or excursion limit and ensure their participation in the program.

(b) Training shall be provided prior to or at the time of initial assignment, unless the employee has received equivalent training within the previous twelve months, and at least annually thereafter.

(c) The training program shall be conducted in a manner which the employee is able to understand. The employer shall ensure that each employee is informed of the following:

(i) The health effects associated with asbestos;

(ii) The relationship between smoking and exposure to asbestos in producing lung cancer;

(iii) Methods of recognizing asbestos and the quantity, location, manner of use, release, and storage of asbestos and the specific nature of operations which could result in exposure to asbestos;

(iv) The engineering controls and work practices associated with the employee's job assignment;

(v) The specific procedures implemented to protect employees from exposure to asbestos such as appropriate work practices, housekeeping procedures, hygiene facilities, decontamination procedures, emergency and clean-up procedures, personal protective equipment to be used, and waste disposal procedures, and any necessary instructions in the use of these controls and procedures;

(vi) The purpose, proper use, and limitations of respirators and protective clothing;

(vii) The purpose and a description of the medical surveillance program required by WAC 296-62-07725; and

(viii) The content of this standard, including appendices.

(d) Access to information and training materials.

(i) The employer shall make a copy of this standard and its appendices readily available without cost to all affected employees.

(ii) The employer shall provide, upon request, all materials relating to the employee information and training program to the director.

(7) Certification.

(a) All individuals working or supervising asbestos projects, as defined in WAC 296-65-003(4) shall be certified as required by WAC 296-65-010, 296-65-012, and 296-65-030.

(b) In cases excepted under WAC 296-65-030 (2) and (3), all employees shall be trained according to subsection (6) of this section, regardless of their exposure levels.

[Statutory Authority: Chapter 49.17 RCW. 89-21-018 (Order 89-10), § 296-62-07721, filed 10/10/89, effective 11/24/89; 89-11-035 (Order 89-03), § 296-62-07721, filed 5/15/89, effective 6/30/89; 87-24-051 (Order 87-24), § 296-62-07721, filed 11/30/87. Statutory Authority: RCW 49.17.050(2) and 49.17.040. 87-10-008 (Order 87-06), § 296-62-07721, filed 4/27/87.]

**WAC 296-62-07723 Housekeeping.** (1) All surfaces shall be maintained as free as practicable of accumulations of dusts and waste containing asbestos.

(2) All spills and sudden releases of material containing asbestos shall be cleaned up as soon as possible.

(3) Surfaces contaminated with asbestos may not be cleaned by the use of compressed air.

(4) Vacuuming. HEPA-filtered vacuuming equipment shall be used for vacuuming. The equipment shall be used and emptied in a manner which minimizes the re-entry of asbestos into the workplace.

(5) Shoveling, dry sweeping, and dry clean-up of asbestos may be used only where vacuuming and/or wet cleaning are not feasible.

(6) Waste disposal. Waste, scrap, debris, bags, containers, equipment, and clothing contaminated with asbestos consigned for disposal, shall be collected and disposed of in sealed impermeable bags, or other closed, impermeable containers. To avoid breakage, bags shall be at least six mils in thickness and shall not be dragged or slid across rough or abrasive surfaces.

(7) Waste removal. Whenever a negative-pressure enclosure is required by WAC 296-62-07712, the employer wherever feasible, shall establish a waste-load-out area that is adjacent and connected to the negative-pressure enclosure, constructed of a two chamber air lock, for the decontamination and removal of asbestos debris.

(8) Deterioration. Asbestos and asbestos containing material which has become damaged or deteriorated shall be repaired, enclosed, encapsulated, or removed.

[Statutory Authority: Chapter 49.17 RCW. 87-24-051 (Order 87-24), § 296-62-07723, filed 11/30/87. Statutory Authority: RCW 49.17.050(2) and 49.17.040. 87-10-008 (Order 87-06), § 296-62-07723, filed 4/27/87.]

#### WAC 296-62-07725 Medical surveillance. (1) General.

(a) Employees covered. The employer shall institute a medical surveillance program for all employees who are or will be exposed to airborne concentrations of fibers of asbestos at or above the action level and/or excursion limit. Exception. Employers in the construction industry shall institute a medical surveillance program for all employees engaged in work involving levels of asbestos at or above the action level for thirty or more days per year, or who are required by this section to wear negative-pressure respirators.

(b) Examination by a physician.

(i) The employer shall ensure that all medical examinations and procedures are performed by or under the supervision of a licensed physician, and shall be provided without cost to the employee and at a reasonable time and place.

(ii) Persons other than licensed physicians, who administer the pulmonary function testing required by this section, shall complete a training course in spirometry sponsored by an appropriate academic or professional institution.

(2) Replacement examinations.

(a) Except as provided by WAC 296-62-07725 (1)(a), before an employee is assigned to an occupation exposed to airborne concentrations of asbestos, a pre-placement medical examination shall be provided or

made available by the employer. Examinations administered using the thirty or more days per year criteria of WAC 296-62-07725 (1)(a) shall be given within ten working days following the thirtieth day of exposure. Examinations must be given prior to assignment of employees to areas where negative-pressure respirators are worn.

(b) All examinations shall include, as a minimum, a medical and work history: A complete physical examination of all systems with special emphasis on the pulmonary, cardiovascular, and gastrointestinal systems; completion of the respiratory disease standardized questionnaire in WAC 296-62-07741, Appendix D, Part 1; a chest roentgenogram (posterior-anterior 14x17 inches); pulmonary function tests to include forced vital capacity (FVC) and forced expiratory volume at 1 second (FEV<sub>1.0</sub>); and any additional tests deemed appropriate by the examining physician. Interpretation and classification of chest roentgenograms shall be conducted in accordance with WAC 296-62-07743, Appendix E.

(3) Periodic examinations.

(a) Periodic medical examinations shall be made available annually.

(b) The scope of the medical examination shall be in conformance with the protocol established in subsection (2)(b) of this section, except that the frequency of chest roentgenograms shall be conducted in accordance with Table 2 of this section, and the abbreviated standardized questionnaire contained in WAC 296-62-07741, Appendix D, Part 2, shall be administered to the employee.

TABLE 2—FREQUENCY OF CHEST ROENTGENOGRAMS

Years since first exposure	Age of employee		
	15 to 35	35+ to 45	45+
0 to 10.....	Every 5 years	Every 5 years	Every 5 years.
10+ .....	Every 5 years	Every 2 years	Every 1 year.

(c) If the examining physician determines that any of the examinations should be provided more frequently than specified, the employer shall provide such examinations to affected employees at the frequencies specified by the physician.

(4) Termination of employment examinations.

(a) The employer shall provide, or make available, a termination of employment medical examination for any employee who has been exposed to airborne concentrations of fibers of asbestos at or above the action level and/or excursion limit.

(b) The medical examination shall be in accordance with the requirements of the periodic examinations stipulated in subsection (3) of this section, and shall be given within thirty calendar days before or after the date of termination of employment.

(5) Recent examinations. No medical examination is required of any employee, if adequate records show that the employee has been examined in accordance with subsection (2), (3), or (4) of this section within the past one-year period.

(6) Information provided to the physician. The employer shall provide the following information to the examining physician:



(a) A copy of this standard and Appendices D, E, and H of WAC 296-62-07741, 296-62-07743, and 296-62-07749 respectively.

(b) A description of the affected employee's duties as they relate to the employee's exposure.

(c) The employee's representative exposure level or anticipated exposure level.

(d) A description of any personal protective and respiratory equipment used or to be used.

(e) Information from previous medical examinations of the affected employee that is not otherwise available to the examining physician.

(7) Physician's written opinion.

(a) The employer shall obtain a written signed opinion from the examining physician. This written opinion shall contain the results of the medical examination and shall include:

(i) The physician's opinion as to whether the employee has any detected medical conditions that would place the employee at an increased risk of material health impairment from exposure to asbestos;

(ii) Any recommended limitations on the employee or upon the use of personal protective equipment such as clothing or respirators; and

(iii) A statement that the employee has been informed by the physician of the results of the medical examination and of any medical conditions resulting from asbestos exposure that require further explanation or treatment.

(b) The employer shall instruct the physician not to reveal in the written opinion given to the employer specific findings or diagnoses unrelated to occupational exposure to asbestos.

(c) The employer shall provide a copy of the physician's written opinion to the affected employee within thirty days from its receipt.

[Statutory Authority: Chapter 49.17 RCW. 89-11-035 (Order 89-03), § 296-62-07725, filed 5/15/89, effective 6/30/89; 87-24-051 (Order 87-24), § 296-62-07725, filed 11/30/87. Statutory Authority: RCW 49.17.050(2) and 49.17.040. 87-10-008 (Order 87-06), § 296-62-07725, filed 4/27/87.]

**WAC 296-62-07727 Recordkeeping.** (1) Exposure measurements.

(a) The employer shall keep an accurate record of all measurements taken to monitor employee exposure to asbestos as prescribed in WAC 296-62-07709.

(b) This record shall include at least the following information:

- (i) Name of employer;
- (ii) Name of person conducting monitoring;
- (iii) The date of measurement;
- (iv) Address of operation or activity;
- (v) Description of the operation or activity involving exposure to asbestos that is being monitored;
- (vi) Personal or area sample;
- (vii) Name, Social Security number, and exposure level of the employees whose exposures are represented;
- (viii) Type of protective devices worn, if any;
- (ix) Pump calibration date and flow rate;
- (x) Total volume of air sampled;
- (xi) Name and address of analytical laboratory;

(xii) Number, duration, and results (f/cc) of samples taken;

(xiii) Date of analysis; and

(xiv) Sampling and analytical methods used and evidence of their accuracy.

(c) The employer shall maintain this record for the duration of employment plus thirty years, in accordance with WAC 296-62-052.

(2) Objective data for exempted operations.

(a) Where the processing, use, or handling of products made from or containing asbestos is exempted from other requirements of this section under WAC 296-62-07709 (2)(c), the employer shall establish and maintain an accurate record of objective data reasonably relied upon in support of the exemption.

(b) The record shall include at least the following:

(i) The product qualifying for exemption;

(ii) The source of the objective data;

(iii) The testing protocol, results of testing, and/or analysis of the material for the release of asbestos;

(iv) A description of the operation exempted and how the data support the exemption; and

(v) Other data relevant to the operations, materials, processing, or employee exposures covered by the exemption.

(c) The employer shall maintain this record for the duration of the employer's reliance upon such objective data.

Note: The employer may utilize the services of competent organizations such as industry trade associations and employee associations to maintain the records required by this section.

(3) Medical surveillance.

(a) The employer shall establish and maintain an accurate record for each employee subject to medical surveillance by WAC 296-62-07725 (1)(a), in accordance with WAC 296-62-052.

(b) The record shall include at least the following information:

(i) The name and Social Security number of the employee;

(ii) Physician's written opinions;

(iii) Any employee medical complaints related to exposure to asbestos;

(iv) A copy of the information provided to the physician as required by WAC 296-62-07725(6); and

(v) A copy of the employee's medical examination results, including the medical history, questionnaire responses, results of any tests, and physicians recommendations.

(c) The employer shall ensure that this record is maintained for the duration of employment plus thirty years, in accordance with WAC 296-62-052.

(4) Training. The employer shall maintain all employee training records for one year beyond the last date of employment of that employee.

(5) Availability.

(a) The employer, upon written request, shall make all records required to be maintained by this section available to the director for examination and copying.

(b) The employer, upon request, shall make any exposure records required by subsection (1) of this section

available for examination and copying to affected employees, former employees, designated representatives, and the director, in accordance with WAC 296-62-05201 through 296-62-05209 and 296-62-05213 through 296-62-05217.

(c) The employer, upon request, shall make employee medical records required by subsection (2) of this section available for examination and copying to the subject employee, to anyone having the specific written consent of the subject employee, and the director, in accordance with WAC 296-62-052.

(6) Transfer of records.

(a) The employer shall comply with the requirements concerning transfer of records set forth in WAC 296-62-05215.

(b) Whenever the employer ceases to do business and there is no successor employer to receive and retain the records for the prescribed period, the employer shall notify the director at least ninety days prior to disposal of records and, upon request, transmit them to the director.

[Statutory Authority: Chapter 49.17 RCW. 87-24-051 (Order 87-24), § 296-62-07727, filed 11/30/87. Statutory Authority: RCW 49.17.050(2) and 49.17.040. 87-10-008 (Order 87-06), § 296-62-07727, filed 4/27/87.]

**WAC 296-62-07731 Dates.** (1) The requirements of the asbestos standard issued in May 1973, as amended, and published in WAC 296-62-07517, remain in effect until compliance is achieved with the parallel provisions of WAC 296-62-077 through 296-62-07753.

(2) Start-up dates. All obligations of WAC 296-62-077 through 296-62-07753 commence on the effective date except as follows:

(a) Hygiene and lunchroom facilities. Changerooms, showers, lavatories, and lunchroom facilities shall be constructed and in use no later than July 20, 1987. However, if as part of the compliance plan for a fixed facility as opposed to mobile or construction type activities it is predicted by an independent engineering firm that engineering controls and work practices will reduce exposures below the time weighted average and/or excursion limit by July 20, 1988, for affected employees, then such facilities need not be completed until one year after the engineering controls are completed, if such controls have not in fact succeeded in reducing exposure to below the permissible exposure limits.

(b) Compliance program. Written compliance programs required by WAC 296-62-07713(2) as a result of initial monitoring shall be completed and available for inspection and copying as soon as possible but no later than July 20, 1987.

(c) Methods of compliance. The engineering and work practice controls as required by WAC 296-62-07713(1) shall be implemented as soon as possible but no later than July 20, 1988.

[Statutory Authority: Chapter 49.17 RCW. 89-11-035 (Order 89-03), § 296-62-07731, filed 5/15/89, effective 6/30/89; 87-24-051 (Order 87-24), § 296-62-07731, filed 11/30/87. Statutory Authority: RCW 49.17.050(2) and 49.17.040. 87-10-008 (Order 87-06), § 296-62-07731, filed 4/27/87.]

**WAC 296-62-07733 Appendices.** (1) The following appendices to this chapter are mandatory.

(a) WAC 296-62-07735, Appendix A—WISHA reference method—Mandatory.

(b) WAC 296-62-07739, Appendix C—Qualitative and quantitative fit testing procedures—Mandatory.

(c) WAC 296-62-07741, Appendix D—Medical questionnaires—Mandatory.

(d) WAC 296-62-07743, Appendix E—Interpretation and classification of chest roentgenograms—Mandatory.

(2) The following appendices to this section are informational and are not intended to create any additional obligations not otherwise imposed or to detract from any existing obligations.

(a) WAC 296-62-07737, Appendix B—Detailed procedure for asbestos sampling and analysis—Nonmandatory.

(b) WAC 296-62-07745, Appendix F—Work practices and engineering controls for automotive brake repair operations—Nonmandatory.

(c) WAC 296-62-07747, Appendix G—Substance technical information for asbestos—Nonmandatory.

(d) WAC 296-62-07749, Appendix H—Medical surveillance guidelines for asbestos—Nonmandatory.

(e) WAC 296-62-07751, Appendix I—Work practices and engineering controls for major asbestos removal, renovation, and demolition operations—Nonmandatory.

(f) WAC 296-62-07753, Appendix J—Work practices and engineering controls for small-scale, short-duration asbestos renovation and maintenance activities—Nonmandatory.

[Statutory Authority: Chapter 49.17 RCW. 87-24-051 (Order 87-24), § 296-62-07733, filed 11/30/87. Statutory Authority: RCW 49.17.050(2) and 49.17.040. 87-10-008 (Order 87-06), § 296-62-07733, filed 4/27/87.]

**WAC 296-62-07735 Appendix A—WISHA reference method—Mandatory.** This mandatory appendix specifies the procedure for analyzing air samples for asbestos and specifies quality control procedures that must be implemented by laboratories performing the analysis. The sampling and analytical methods described below represent the elements of the available monitoring methods (such as the NIOSH 7400 method) which WISHA considers to be essential to achieve adequate employee exposure monitoring while allowing employers to use methods that are already established within their organizations. All employers who are required to conduct air monitoring under WAC 296-62-07709 are required to utilize analytical laboratories that use this procedure, or an equivalent method recognized by the department, for collecting and analyzing samples.

(1) Sampling and analytical procedure.

(a) The sampling medium for air samples shall be mixed cellulose ester filter membranes. These shall be designated by the manufacturer as suitable for asbestos counting. See below for rejection of blanks.

(b) The preferred collection device shall be the 25-mm diameter cassette with an open-faced 50-mm electrically conductive extension cowl. The 37-mm cassette may be used if necessary but only if written justification for the need to use the 37-mm filter cassette accompanies the sample results in the employee's exposure monitoring record.

(c) An air flow rate between 0.5 liter/min and 4.0 liters/min shall be selected for the 25-mm cassette. If the 37-mm cassette is used, an air flow rate between 1 liter/min and 4.0 liters/min shall be selected.

(d) Where possible, a sufficient air volume for each air sample shall be collected to yield between one hundred and one thousand three hundred fibers per square millimeter on the membrane filter. If a filter darkens in appearance or if loose dust is seen on the filter, a second sample shall be started.

(e) Ship the samples in a rigid container with sufficient packing material to prevent dislodging the collected fibers. Packing material that has a high electrostatic charge on its surface (e.g., expanded polystyrene) cannot be used because such material can cause loss of fibers to the sides of the cassette.

(f) Calibrate each personal sampling pump before and after use with a representative filter cassette installed between the pump and the calibration devices.

(g) Personal samples shall be taken in the "breathing zone" of the employee (i.e., attached to or near the collar or lapel near the worker's face).

(h) Fiber counts shall be made by positive phase contrast using a microscope with an 8 to 10 X eyepiece and a 40 to 45 X objective for a total magnification of approximately 400 X and a numerical aperture of 0.65 to 0.75. The microscope shall also be fitted with a green or blue filter.

(i) The microscope shall be fitted with a Walton-Beckett eyepiece graticule calibrated for a field diameter of one hundred micrometers (+/-2 micrometers).

(j) The phase-shift detection limit of the microscope shall be about 3 degrees measured using the HSE phase shift test slide as outlined below.

(i) Place the test slide on the microscope stage and center it under the phase objective.

(ii) Bring the blocks of grooved lines into focus.

Note: The slide consists of seven sets of grooved lines (ca. 20 grooves to each block) in descending order of visibility from sets one to seven, seven being the least visible. The requirements for asbestos counting are that the microscope optics must resolve the grooved lines in set three completely, although they may appear somewhat faint, and that the grooved lines in sets six and seven must be invisible. Sets four and five must be at least partially visible but may vary slightly in visibility between microscopes. A microscope that fails to meet these requirements has either too low or too high a resolution to be used for asbestos counting.

(iii) If the image deteriorates, clean and adjust the microscope optics. If the problem persists, consult the microscope manufacturer.

(k) Each set of samples taken will include ten percent blanks or a minimum of two blanks. The blank results shall be averaged and subtracted from the analytical results before reporting. Any samples represented by a

blank having a fiber count in excess of seven fibers/one hundred fields shall be rejected.

(l) The samples shall be mounted by the acetone/triacetin method or a method with an equivalent index of refraction and similar clarity.

(m) Observe the following counting rules.

(i) Count only fibers equal to or longer than five micrometers. Measure the length of curved fibers along the curve.

(ii) In the absence of other information, count all particles as asbestos that have a length-to-width ratio (aspect ratio) of three to one or greater.

(iii) Fibers lying entirely within the boundary of the Walton-Beckett graticule field shall receive a count of one. Fibers crossing the boundary once, having one end within the circle, shall receive the count of one-half. Do not count any fiber that crosses the graticule boundary more than once. Reject and do not count any other fibers even though they may be visible outside the graticule area.

(iv) Count bundles of fibers as one fiber unless individual fibers can be identified by observing both ends of an individual fiber.

(v) For a 25mm filter, count enough graticule fields to yield one hundred fibers by counting a minimum of twenty fields. If less than ten fibers are found after counting one hundred fields and the sample air volume is less than sixty liters, count a total number of fields calculated from the following formulas:

$$\begin{aligned} N &= 6000/V && \text{For TWA Determination (QL = 0.085)} \\ N &= 2400/V && \text{For Ceiling Determinations (QL = 0.21)} \end{aligned}$$

Where N = Number of fields counted on a 25mm filter  
V = Air volume of sample in liters  
QL = Limit of reliable quantification in fibers/cc for the NIOSH 7400 method

Note: Filter samples (25mm) with air volumes of less than thirty liters will have decreased analytical accuracy and precision and should be avoided.

(vi) For a 37mm filter, count enough graticule fields to yield one hundred fibers by counting a minimum of twenty fields. If less than one hundred fibers are found after counting one hundred fields and the sample air volume is less than one hundred thirty-three liters, count a total number of fields calculated from the following formulas:

$$\begin{aligned} N &= 13300/V && \text{For TWA Determination (QL = 0.085)} \\ N &= 5320/V && \text{For Ceiling Determinations (QL = 0.21)} \end{aligned}$$

Where N = Number of fields counted on a 37mm filter  
V = Air volume of sample in liters  
QL = Limit of reliable quantification in fibers/cc

Note: Filter samples (37mm) with air volumes of less than seventy liters will have decreased analytical accuracy and precision and should be avoided.

(n) Blind recounts shall be conducted at the rate of ten percent.

(2) Quality control procedures.

(a) Intralaboratory program. Each laboratory and/or each company with more than one microscopist counting slides shall establish a statistically designed quality assurance program involving blind recounts and comparisons between microscopists to monitor the variability of counting by each microscopist and between

microscopists. In a company with more than one laboratory, the program shall include all laboratories and shall also evaluate the laboratory-to-laboratory variability.

(b) Interlaboratory program. Each laboratory analyzing asbestos samples for compliance determination shall implement an interlaboratory quality assurance program that as a minimum includes participation of at least two other independent laboratories. Each laboratory shall participate in round robin testing at least once every six months with at least all the other laboratories in its interlaboratory quality assurance group. Each laboratory shall submit slides typical of its own work load for use in this program. The round robin shall be designed and results analyzed using appropriate statistical methodology.

(c) All individuals performing asbestos analysis must have taken the NIOSH course for sampling and evaluating airborne asbestos dust or an equivalent course, recognized by the department.

(d) When the use of different microscopes contributes to differences between counters and laboratories, the effect of the different microscope shall be evaluated and the microscope shall be replaced, as necessary.

(e) Current results of these quality assurance programs shall be posted in each laboratory to keep the microscopists informed.

[Statutory Authority: Chapter 49.17 RCW. 87-24-051 (Order 87-24), § 296-62-07735, filed 11/30/87. Statutory Authority: RCW 49.17.050(2) and 49.17.040. 87-10-008 (Order 87-06), § 296-62-07735, filed 4/27/87.]

**WAC 296-62-07737 Appendix B--Detailed procedure for asbestos sampling and analysis--Nonmandatory.** This appendix contains a detailed procedure for sampling and analysis and includes those critical elements specified in WAC 296-62-07735, Appendix A. Employers are not required to use this procedure, but they are required to use Appendix A. The purpose of Appendix B is to provide a detailed step-by-step sampling and analysis procedure that conforms to the elements specified in WAC 296-62-07735, Appendix A. Since this procedure may also standardize the analysis and reduce variability, WISHA encourages employers to use this appendix.

#### Asbestos Sampling and Analysis Method

Technique: Microscopy, phase contrast.

Analyte: Fibers (manual count).

Sample preparation: Acetone/triacetin method.

Calibration: Phase-shift detection limit about three degrees.

Range: One hundred to one thousand three hundred fibers/mm<sup>2</sup> filter area.

Estimated limit of detection: Seven fibers/mm<sup>2</sup> filter area.

Sampler: Filter (0.8-1.2 um mixed cellulose ester membrane, 25-mm diameter).

Flow rate: 0.5 L/min to 4.0 L/min (25-mm cassette)  
1.0 L/min to 4.0 L/min (37-mm cassette).

Sample volume: Adjust to obtain one hundred to one thousand three hundred fibers/mm<sup>2</sup>.

Shipment: Routine.

Sample stability: Indefinite.

Blanks: Ten percent of samples (minimum two)  
Standard analytical error: 0.25.

Applicability: The working range is 0.02 f/cc (1920-L air sample) to 1.25 f/cc (400-L air sample). The method gives an index of airborne asbestos fibers but may be used for other materials such as fibrous glass by inserting suitable parameters into the counting rules. The method does not differentiate between asbestos and other fibers. Asbestos fibers less than ca. 0.25 um diameter will not be detected by this method.

Interferences: Any other airborne fiber may interfere since all particles meeting the counting criteria are counted. Chain-like particles may appear fibrous. High levels of nonfibrous dust particles may obscure fibers in the field of view and raise the detection limit.

(1) Reagents.

(a) Acetone.

(b) Triacetin (glycerol triacetate), reagent grade.

Special precautions: Acetone is an extremely flammable liquid and precautions must be taken not to ignite it. Heating of acetone must be done in a ventilated laboratory fume hood using a flameless, spark-free heat source.

(2) Equipment.

(a) Collection device: 25-mm cassette with 50-mm electrically conductive extension cowl with cellulose ester filter, 0.8 to 1.2 mm pore size and backup pad.

Note: Analyze representative filters for fiber background before use and discard the filter lot if more than five fibers/one hundred fields are found.

(b) Personal sampling pump, greater than or equal to 0.5 L/min. with flexible connecting tubing.

(c) Microscope, phase contrast, with green or blue filter, 8 to 10 X eyepiece, and 40 to 45 X phase objective (total magnification ca. 400 X); numerical aperture = 0.65 to 0.75.

(d) Slides, glass, single-frosted, precleaned, 25 x 75 mm.

(e) Cover slips, 25 x 25 mm, No. 1 1/2 unless otherwise specified by microscope manufacturer.

(f) Knife, No. 1 surgical steel, curved blade.

(g) Tweezers.

(h) Flask, Guth-type, insulated neck, 250 to 500 mL (with single-hole rubber stopper and elbow-jointed glass tubing, 16 to 22 cm long).

(i) Hotplate, spark-free, stirring type; heating mantle; or infrared lamp and magnetic stirrer.

(j) Syringe, hypodermic, with 22-gauge needle.

(k) Graticule, Walton-Beckett type with 100 um diameter circular field at the specimen plane (area = 0.00785 mm<sup>2</sup>), (Type G-22).

Note: The graticule is custom-made for each microscope.

(l) HSE/NPL phase contrast test slide, Mark II.

(m) Telescope, ocular phase-ring centering.

(n) Stage micrometer (0.01 mm divisions).

(3) Sampling.

(a) Calibrate each personal sampling pump with a representative sampler in line.

(b) Fasten the sampler to the worker's lapel as close as possible to the worker's mouth. Remove the top cover

from the end of the cowl extension (open face) and orient face down. Wrap the joint between the extender and the monitor's body with shrink tape to prevent air leaks.

(c) Submit at least two blanks (or ten percent of the total samples, whichever is greater) for each set of samples. Remove the caps from the field blank cassettes and store the caps and cassettes in a clean area (bag or box) during the sampling period. Replace the caps in the cassettes when sampling is completed.

(d) Sample at 0.5 L/min or greater. Do not exceed 1 mg total dust loading on the filter. Adjust sampling flow rate,  $Q$  (L/min), and time to produce a fiber density,  $E$  (fibers/mm<sup>2</sup>), of one hundred to one thousand three hundred fibers/mm<sup>2</sup> ( $3.85 \times 10^4$  to  $5 \times 10^5$  fibers per 25-mm filter with effective collection area ( $A_c=385$  mm<sup>2</sup>)) for optimum counting precision (see subsection (7)(a) of this section). Calculate the minimum sampling time,  $T$  (minutes) at the action level (one-half of the current standard),  $L$  (f/cc) of the fibrous aerosol being sampled:

$$T = \frac{(A_c)(E)}{(Q)(L)10^3}$$

(e) Remove the field monitor at the end of sampling, replace the plastic top cover and small end caps, and store the monitor.

(f) Ship the samples in a rigid container with sufficient packing material to prevent jostling or damage.

Note: Do not use polystyrene foam in the shipping container because of electrostatic forces which may cause fiber loss from the sample filter.

#### (4) Sample preparation.

Note: The object is to produce samples with a smooth (nongrainy) background in a medium with a refractive index equal to or less than 1.46. The method below collapses the filter for easier focusing and produces permanent mounts which are useful for quality control and interlaboratory comparison. Other mounting techniques meeting the above criteria may also be used, e.g., the nonpermanent field mounting technique used in P & CAM 239.

(a) Ensure that the glass slides and cover slips are free of dust and fibers.

(b) Place 40 to 60 ml of acetone into a Guth-type flask. Stopper the flask with a single-hole rubber stopper through which a glass tube extends 5 to 8 cm into the flask. The portion of the glass tube that exits the top of the stopper (8 to ten cm) is bent downward in an elbow that makes an angle of twenty to thirty degrees with the horizontal.

(c) Place the flask in a stirring hotplate or wrap in a heating mantle. Heat the acetone gradually to its boiling temperature (ca. 58°C).

Caution: The acetone vapor must be generated in a ventilated fume hood away from all open flames and spark sources. Alternate heating methods can be used, providing no open flame or sparks are present.

(d) Mount either the whole sample filter or a wedge cut from the sample filter on a clean glass slide.

(i) Cut wedges of ca. twenty-five percent of the filter area with a curved-blade steel surgical knife using a rocking motion to prevent tearing.

(ii) Place the filter or wedge, dust slide up, on the slide. Static electricity will usually keep the filter on the slide until it is cleared.

(iii) Hold the glass slide supporting the filter approximately 1 to 2 cm from the glass tube port where the acetone vapor is escaping from the heated flask. The acetone vapor stream should cause a condensation spot on the glass slide ca. 2 to 3 cm in diameter. Move the glass slide gently in the vapor stream. The filter should clear in two to five seconds. If the filter curls, distorts, or is otherwise rendered unusable, the vapor stream is probably not strong enough. Periodically wipe the outlet port with tissue to prevent liquid acetone dripping onto the filter.

(iv) Using the hypodermic syringe with a 22-gauge needle, place one to two drops of triacetin on the filter. Gently lower a clean 25-mm square cover slip down onto the filter at a slight angle to reduce the possibility of forming bubbles. If too many bubbles form or the amount of triacetin is insufficient, the cover slip may become detached within a few hours.

(v) Glue the edges of the cover slip to the glass slide using a lacquer or nail polish.

Note: If clearing is slow, the slide preparation may be heated on a hotplate (surface temperature 50°C) for fifteen minutes to hasten clearing. Counting may proceed immediately after clearing and mounting are completed.

#### (5) Calibration and quality control.

(a) Calibration of the Walton-Beckett graticule. The diameter,  $d_c$ (mm), of the circular counting area and the disc diameter must be specified when ordering the graticule.

(i) Insert any available graticule into the eyepiece and focus so that the graticule lines are sharp and clear.

(ii) Set the appropriate interpupillary distance and, if applicable, reset the binocular head adjustment so that the magnification remains constant.

(iii) Install the 40 to 45 X phase objective.

(iv) Place a stage micrometer on the microscope object stage and focus the microscope on the graduated lines.

(v) Measure the magnified grid length,  $L_o$ (um) using the stage micrometer.

(vi) Remove the graticule from the microscope and measure its actual grid length,  $L_a$ (mm). This can best be accomplished by using a stage fitted with verniers.

(vii) Calculate the circle diameter,  $d_c$ (mm), for the Walton-Beckett graticule:

$$d_c = \frac{L_a \times D}{L_o}$$

Example: If  $L_o = 108$  um,  $L_a = 2.93$  mm and  $D = 100$  um, then  $d_c = 2.71$  mm.

(viii) Check the field diameter,  $D$  (acceptable range 100 mm  $\pm$  2 mm) with a stage micrometer upon receipt of the graticule from the manufacturer. Determine field area (mm<sup>2</sup>).

(b) Microscope adjustments. Follow the manufacturer's instructions and also the following:

(i) Adjust the light source for even illumination across the field of view at the condenser iris.

Note: Kohler illumination is preferred, where available.

(ii) Focus on the particulate material to be examined.

(iii) Make sure that the field iris is in focus, centered on the sample, and open only enough to fully illuminate the field of view.

(iv) Use the telescope ocular supplied by the manufacturer to ensure that the phase rings (annular diaphragm and phase-shifting elements) are concentric.

(c) Check the phase-shift detection limit of the microscope periodically.

(i) Remove the HSE/NPL phase-contrast test slide from its shipping container and center it under the phase objective.

(ii) Bring the blocks of grooved lines into focus.

Note: The slide consists of seven sets of grooves (ca. 20 grooves to each block) in descending order of visibility from sets one to seven. The requirements for counting are that the microscope optics must resolve the grooved lines in set three completely, although they may appear somewhat faint, and that the grooved lines in sets six to seven must be invisible. Sets four and five must be at least partially visible but may vary slightly in visibility between microscopes. A microscope which fails to meet these requirements has either too low or too high a resolution to be used for asbestos, tremolite, anthophyllite, and actinolite counting.

(iii) If the image quality deteriorates, clean the microscope optics and, if the problem persists, consult the microscope manufacturer.

(d) Quality control of fiber counts.

(i) Prepare and count field blanks along with the field samples. Report the counts on each blank. Calculate the mean of the field blank counts and subtract this value from each sample count before reporting the results.

Note 1: The identity of the blank filters should be unknown to the counter until all counts have been completed.

Note 2: If a field blank yields fiber counts greater than seven fibers/one hundred fields, report possible contamination of the samples.

(ii) Perform blind recounts by the same counter on ten percent of filters counted (slides relabeled by a person other than the counter).

(e) Use the following test to determine whether a pair of counts on the same filter should be rejected because of possible bias. This statistic estimates the counting repeatability at the ninety-five percent confidence level. Discard the sample if the difference between the two counts exceeds  $2.77(F)s_r$ , where  $F$  = average of the two fiber counts and  $s_r$  = relative standard deviation, which should be derived by each laboratory based on historical in-house data.

Note: If a pair of counts is rejected as a result of this test, recount the remaining samples in the set and test the new counts against the first counts. Discard all rejected paired counts.

(f) Enroll each new counter in a training course that compares performance of counters on a variety of samples using this procedure.

Note: To ensure good reproducibility, all laboratories engaged in asbestos counting are required to participate in the proficiency

analytical testing (PAT) program and should routinely participate with other asbestos fiber counting laboratories in the exchange of field samples to compare performance of counters.

#### (6) Measurement.

(a) Place the slide on the mechanical stage of the calibrated microscope with the center of the filter under the objective lens. Focus the microscope on the plane of the filter.

(b) Regularly check phase-ring alignment and Kohler illumination.

(c) The following are the counting rules:

(i) Count only fibers 5  $\mu$ m or longer in length. Measure the length of curved fibers along the curve.

(ii) Count only fibers with a length-to-width ratio equal to or greater than three to one.

(iii) For fibers that cross the boundary of the graticule field, do the following:

(A) Count any fiber 5  $\mu$ m or longer in length that lies entirely within the graticule area.

(B) Count as one-half fiber any fiber with only one end lying within the graticule area.

(C) Do not count any fiber that crosses the graticule boundary more than once.

(D) Reject and do not count all other fibers.

(iv) Count bundles of fibers as one fiber unless individual fibers can be identified by observing both ends of a fiber.

(v) For a 25mm filter, count enough graticule fields to yield one hundred fibers by counting a minimum of twenty fields. If less than ten fibers are found after counting one hundred fields and the sample air volume is less than sixty liters, count a total number of fields calculated from the following formulas:

$$N = 6000/V \quad \text{For TWA Determination (QL = 0.085)}$$

$$N = 2400/V \quad \text{For Ceiling Determinations (QL = 0.21)}$$

Where  $N$  = Number of fields counted on a 25mm filter  
 $V$  = Air volume of sample in liters  
 $QL$  = Limit of reliable quantification in fibers/cc for the NIOSH 7400 method

Note: Filter samples (25mm) with air volumes of less than thirty liters will have decreased analytical accuracy and precision and should be avoided.

(vi) For a 37mm filter, count enough graticule fields to yield one hundred fibers by counting a minimum of twenty fields. If less than one hundred fibers are found after counting one hundred fields and the sample air volume is less than one hundred thirty-three liters, count a total number of fields calculated from the following formulas:

$$N = 13300/V \quad \text{For TWA Determination (QL = 0.085)}$$

$$N = 5320/V \quad \text{For Ceiling Determinations (QL = 0.21)}$$

Where  $N$  = Number of fields counted on a 37mm filter  
 $V$  = Air volume of sample in liters  
 $QL$  = Limit of reliable quantification in fibers/cc

Note: Filter samples (37mm) with air volumes of less than seventy liters will have decreased analytical accuracy and precision and should be avoided.

(d) Start counting from one end of the filter and progress along a radial line to the other end, shift either up or down on the filter, and continue in the reverse direction. Select fields randomly by looking away from the eyepiece briefly while advancing the mechanical stage.



When an agglomerate covers ca. 1/6 or more of the field of view, reject the field and select another. Do not report rejected fields in the number of total fields counted.

Note: When counting a field, continuously scan a range of focal planes by moving the fine focus knob to detect very fine fibers which have become embedded in the filter. The small-diameter fibers will be very faint but are an important contribution to the total count.

(7) Calculations.

(a) Calculate and report fiber density on the filter, E (fibers/mm<sup>2</sup>); by dividing the total fiber count, F; minus the mean field blank count, B, by the number of fields, n; and the field area, A<sub>f</sub>(0.00785 mm<sup>2</sup> for a properly calibrated Walton-Beckett graticule):

$$E = \frac{(F/n_f) - (B/n_b)}{(A_f)} \text{ fibers/mm}^2$$

Where: n<sub>f</sub> = number of fields in submission sample

n<sub>b</sub> = number of fields in blank sample

(b) Calculate the concentration, C (f/cc), of fibers in the air volume sampled, V (L), using the effective collection area of the filter, A<sub>c</sub>(385 mm<sup>2</sup> for a 25-mm filter):

$$C = \frac{(E)(A_c)}{V(10^3)}$$

Note: Periodically check and adjust the value of A<sub>c</sub>, if necessary.

Bulk sample collection and analysis.

Bulk samples should be collected as specified in Appendix G, Section 1 of the United States Environmental Protection Agency (EPA) publication No. 560/5-85-024 (June 1985) entitled *Guidance for Controlling Asbestos-Containing Materials in Buildings*.

Analysis of the samples should be conducted by polarizing light microscopy in a qualified laboratory. In certain cases, x-ray diffraction may be required to confirm the presence of asbestos. Qualified laboratories must be participants in the EPA bulk asbestos quality assurance program or other bulk asbestos quality assurance program recognized by the department.

[Statutory Authority: Chapter 49.17 RCW. 87-24-051 (Order 87-24), § 296-62-07737, filed 11/30/87. Statutory Authority: RCW 49.17.050(2) and 49.17.040. 87-10-008 (Order 87-06), § 296-62-07737, filed 4/27/87.]

**WAC 296-62-07739 Appendix C--Qualitative and quantitative fit testing procedures--Mandatory. (1) Qualitative fit test protocols.**

(a) Isoamyl acetate protocol.

(i) Odor threshold screening:

(A) Three one-liter glass jars with metal lids (e.g., Mason or Ball jars) are required.

(B) Odor free water (e.g., distilled or spring water) at approximately 25°C shall be used for the solutions.

(C) The isoamyl acetate (IAA) (also known as isopentyl acetate) stock solution is prepared by adding one cc of pure IAA to eight hundred cc of odor free water in a one-liter jar and shaking for thirty seconds. This solution shall be prepared new at least weekly.

(D) The screening test shall be conducted in a room separate from the room used for actual fit testing. The

two rooms shall be well ventilated but shall not be connected to the same recirculating ventilation system.

(E) The odor test solution is prepared in a second jar by placing 0.4 cc of the stock solution into five hundred cc of odor free water using a clean dropper or pipette. Shake for thirty seconds and allow to stand for two to three minutes so that the IAA concentration above the liquid may reach equilibrium. This solution may be used for only one day.

(F) A test blank is prepared in a third jar by adding five hundred cc of odor free water.

(G) The odor test and test blank jars shall be labelled one and two for jar identification. If the labels are put on the lids they can be periodically peeled, dried off and switched to maintain the integrity of the test.

(H) The following instructions shall be typed on a card and placed on the table in front of the two test jars (i.e., one and two): "The purpose of this test is to determine if you can smell banana oil at a low concentration. The two bottles in front of you contain water. One of these bottles also contains a small amount of banana oil. Be sure the covers are on tight, then shake each bottle for two seconds. Unscrew the lid of each bottle, one at a time, and sniff at the mouth of the bottle. Indicate to the test conductor which bottle contains banana oil."

(I) The mixtures used in the IAA odor detection test shall be prepared in an area separate from where the test is performed, in order to prevent olfactory fatigue in the subject.

(J) If the test subject is unable to correctly identify the jar containing the odor test solution, the IAA qualitative fit test may not be used.

(K) If the test subject correctly identifies the jar containing the odor test solution, the test subject may proceed to respirator selection and fit testing.

(ii) Respirator selection.

(A) The test subject shall be allowed to pick the most comfortable respirator from a selection including respirators of various sizes from different manufacturers. The selection shall include at least five sizes of elastomeric half facepieces, from at least two manufacturers.

(B) The selection process shall be conducted in a room separate from the fit-test chamber to prevent odor fatigue. Prior to the selection process, the test subject shall be shown how to put on a respirator, how it should be positioned on the face, how to set strap tension and how to determine a "comfortable" respirator. A mirror shall be available to assist the subject in evaluating the fit and positioning of the respirator. This instruction may not constitute the subject's formal training on respirator use, as it is only a review.

(C) The test subject should understand that the employee is being asked to select the respirator which provides the most comfortable fit. Each respirator represents a different size and shape and, if fit properly and used properly will provide adequate protection.

(D) The test subject holds each facepiece up to the face and eliminates those which obviously do not give a comfortable fit. Normally, selection will begin with a half-mask and if a good fit cannot be found, the subject will be asked to test the full facepiece respirators. (A

small percentage of users will not be able to wear any half-mask.)

(E) The more comfortable facepieces are noted; the most comfortable mask is donned and worn at least five minutes to assess comfort. All donning and adjustments of the facepiece shall be performed by the test subject without assistance from the test conductor or other person. Assistance in assessing comfort can be given by discussing the points in (a)(ii)(F) of this subsection. If the test subject is not familiar with using a particular respirator, the test subject shall be directed to don the mask several times and to adjust the straps each time to become adept at setting proper tension on the straps.

(F) Assessment of comfort shall include reviewing the following points with the test subject and allowing the test subject adequate time to determine the comfort of the respirator:

(I) Positioning of mask on nose.

(II) Room for eye protection.

(III) Room to talk.

(IV) Positioning mask on face and cheeks.

(G) The following criteria shall be used to help determine the adequacy of the respirator fit:

(I) Chin properly placed.

(II) Strap tension.

(III) Fit across nose bridge.

(IV) Distance from nose to chin.

(V) Tendency to slip.

(VI) Self-observation in mirror.

(H) The test subject shall conduct the conventional negative and positive-pressure fit checks before conducting the negative- or positive-pressure test the subject shall be told to "seat" the mask by rapidly moving the head from side-to-side and up and down, while taking a few deep breaths.

(I) The test subject is now ready for fit testing.

(J) After passing the fit test, the test subject shall be questioned again regarding the comfort of the respirator. If it has become uncomfortable, another model of respirator shall be tried.

(K) The employee shall be given the opportunity to select a different facepiece and be retested if the chosen facepiece becomes increasingly uncomfortable at any time.

(iii) Fit test.

(A) The fit test chamber shall be similar to a clear fifty-five gallon drum liner suspended inverted over a two-foot diameter frame, so that the top of the chamber is about six inches above the test subject's head. The inside top center of the chamber shall have a small hook attached.

(B) Each respirator used for the fitting and fit testing shall be equipped with organic vapor cartridges or offer protection against organic vapors. The cartridges or masks shall be changed at least weekly.

(C) After selecting, donning, and properly adjusting a respirator, the test subject shall wear it to the fit testing room. This room shall be separate from the room used for odor threshold screening and respirator selection, and shall be well ventilated, as by an exhaust fan or lab hood, to prevent general room contamination.

(D) A copy of the following test exercises and "rainbow passage" shall be taped to the inside of the test chamber:

Test exercises.

(I) Breathe normally.

(II) Breathe deeply. Be certain breaths are deep and regular.

(III) Turn head all the way from one side to the other. Inhale on each side. Be certain movement is complete. Do not bump the respirator against the shoulders.

(IV) Nod head up and down. Inhale when head is in the full up position (looking toward ceiling). Be certain motions are complete and made about every second. Do not bump the respirator on the chest.

(V) Talking. Talk aloud and slowly for several minutes. The following paragraph is called the "rainbow passage." Reading it will result in a wide range of facial movements, and thus be useful to satisfy this requirement. Alternative passages which serve the same purpose may also be used.

(VI) Jogging in place.

(VII) Breathe normally.

"Rainbow Passage."

When the sunlight strikes raindrops in the air, they act like a prism and form a rainbow. The rainbow is a division of white light into many beautiful colors. These take the shape of a long round arch, with its path high above, and its two ends apparently beyond the horizon. There is, according to legend, a boiling pot of gold at one end. People look, but no one ever finds it. When a man looks for something beyond reach, his friends say he is looking for the pot of gold at the end of the rainbow.

(E) Each test subject shall wear the respirator for at least ten minutes before starting the fit test.

(F) Upon entering the test chamber, the test subject shall be given a six-inch by five-inch piece of paper towel or other porous absorbent single ply material, folded in half and wetted with three-quarters of one cc of pure IAA. The test subject shall hang the wet towel on the hook at the top of the chamber.

(G) Allow two minutes for the IAA test concentration to be reached before starting the fit-test exercises. This would be an appropriate time to talk with the test subject, to explain the fit test, the importance of cooperation, the purpose for the head exercises, or to demonstrate some of the exercises.

(H) Each exercise described in (D) of this subsection shall be performed for at least one minute.

(I) If at any time during the test, the subject detects the banana-like odor of IAA, the test has failed. The subject shall quickly exit from the test chamber and leave the test area to avoid olfactory fatigue.

(J) If the test is failed, the subject shall return to the selection room and remove the respirator, repeat the odor sensitivity test, select and put on another respirator, return to the test chamber, and again begin the procedure described in (b)(iii)(D) through (H) of this subsection. The process continues until a respirator that fits well has been found. Should the odor sensitivity test be failed, the subject shall wait about five minutes before

retesting. Odor sensitivity will usually have returned by this time.

(K) If a person cannot pass the fit test described above wearing a half-mask respirator from the available selection, full facepiece models must be used.

(L) When a respirator is found that passes the test, the subject breaks the face seal and takes a breath before exiting the chamber. This is to assure that the reason the test subject is not smelling the IAA is the good fit of the respirator facepiece seal and not olfactory fatigue.

(M) When the test subject leaves the chamber, the subject shall remove the saturated towel and return it to the person conducting the test. To keep the area from becoming contaminated, the used towels shall be kept in a self-sealing bag so there is no significant IAA concentration buildup in the test chamber during subsequent tests.

(N) At least two facepieces shall be selected for the IAA test protocol. The test subject shall be given the opportunity to wear them for one week to choose the one which is more comfortable to wear.

(O) Persons who have successfully passed this fit test with a half-mask respirator may be assigned the use of the test respirator in atmospheres with up to 2 f/cc of airborne asbestos.

(P) The test shall not be conducted if there is any hair growth between the skin and the facepiece sealing surface.

(Q) If hair growth or apparel interfere with a satisfactory fit, then they shall be altered or removed so as to eliminate interference and allow a satisfactory fit. If a satisfactory fit is still not attained, the test subject must use a positive-pressure respirator such as powered air-purifying respirators, supplied-air respirator, or self-contained breathing apparatus.

(R) If a test subject exhibits difficulty in breathing during the tests, she or he shall be referred to a physician trained in respirator diseases or pulmonary medicine to determine whether the test subject can wear a respirator while performing her or his duties.

(S) Qualitative fit testing shall be repeated at least every six months.

(T) In addition, because the sealing of the respirator may be affected, qualitative fit testing shall be repeated immediately when the test subject has a:

- (I) Weight change of twenty pounds or more,
- (II) Significant facial scarring in the area of the facepiece seal,
- (III) Significant dental changes; i.e., multiple extractions without prosthesis, or acquiring dentures,
- (IV) Reconstructive or cosmetic surgery, or
- (V) Any other condition that may interfere with facepiece sealing.

(iv) Recordkeeping.

A summary of all test results shall be maintained in each office for three years. The summary shall include:

- (A) Name of test subject.
- (B) Date of testing.
- (C) Name of the test conductor.
- (D) Respirators selected (indicate manufacturer, model, size and approval number).

(E) Testing agent.

(b) Saccharin solution aerosol protocol.

(i) Respirator selection. Respirators shall be selected as described in (a)(ii) of this subsection (respirator selection), except that each respirator shall be equipped with a particulate filter.

(ii) Taste threshold screening.

(A) An enclosure about head and shoulders shall be used for threshold screening (to determine if the individual can taste saccharin) and for fit testing. The enclosure shall be approximately twelve inches in diameter by fourteen inches tall with at least the front clear to allow free movement of the head when a respirator is worn.

(B) The test enclosure shall have a three-quarter inch hole in front of the test subject's nose and mouth area to accommodate the nebulizer nozzle.

(C) The entire screening and testing procedure shall be explained to the test subject prior to conducting the screening test.

(D) During the threshold screening test, the test subject shall don the test enclosure and breathe with open mouth with tongue extended.

(E) Using a DeVilbiss Model 40 Inhalation Medication Nebulizer or equivalent, the test conductor shall spray the threshold check solution into the enclosure. This nebulizer shall be clearly marked to distinguish it from the fit test solution nebulizer.

(F) The threshold check solution consists of 0.83 grams of sodium saccharin, USP in water. It can be prepared by putting 1 cc of the test solution (see (b)(iii)(G) of this subsection) in one hundred cc of water.

(G) To produce the aerosol, the nebulizer bulb is firmly squeezed so that it collapses completely, then is released and allowed to fully expand.

(H) Ten squeezes of the nebulizer bulb are repeated rapidly and then the test subject is asked whether the saccharin can be tasted.

(I) If the first response is negative, ten more squeezes of the nebulizer bulb are repeated rapidly and the test subject is again asked whether the saccharin can be tasted.

(J) If the second response is negative, ten more squeezes are repeated rapidly and the test subject is again asked whether the saccharin can be tasted.

(K) The test conductor will take note of the number of squeezes required to elicit a taste response.

(L) If the saccharin is not tasted after thirty squeezes ((b)(ii)(J) of this subsection), the saccharin fit test cannot be performed on the test subject.

(M) If a taste response is elicited, the test subject shall be asked to take note of the taste for reference in the fit test.

(N) Correct use of the nebulizer means that approximately 1 cc of liquid is used at a time in the nebulizer body.

(O) The nebulizer shall be thoroughly rinsed in water, shaken dry, and refilled at least every four hours.

(iii) Fit test.

(A) The test subject shall don and adjust the respirator without the assistance from any person.

(B) The fit test uses the same enclosure described in (b)(ii) of this subsection.

(C) Each test subject shall wear the respirator for at least ten minutes before starting the fit test.

(D) The test subject shall don the enclosure while wearing the respirator selected in (a)(ii) of this subsection. This respirator shall be properly adjusted and equipped with a particulate filter.

(E) The test subject may not eat, drink, (except plain water), or chew gum for fifteen minutes before the test.

(F) A second DeVilbiss Model 40 Inhalation Medication Nebulizer is used to spray the fit test solution into the enclosure. This nebulizer shall be clearly marked to distinguish it from the screening test solution nebulizer.

(G) The fit test solution is prepared by adding eighty-three grams of sodium saccharin to one hundred cc of warm water.

(H) As before, the test subject shall breathe with mouth open and tongue extended.

(I) The nebulizer is inserted into the hole in the front of the enclosure and the fit test solution is sprayed into the enclosure using the same technique as for the taste threshold screening and the same number of squeezes required to elicit a taste response in the screening. (See (b)(ii)(H) through (J) of this subsection.)

(J) After generation of the aerosol read the following instructions to the test subject. The test subject shall perform the exercises for one minute each.

(I) Breathe normally.

(II) Breathe deeply. Be certain breaths are deep and regular.

(III) Turn head all the way from one side to the other. Be certain movement is complete. Inhale on each side. Do not bump the respirator against the shoulders.

(IV) Nod head up and down. Be certain motions are complete. Inhale when head is in the full up position (when looking toward the ceiling). Do not bump the respirator on the chest.

(V) Talking. Talk aloud and slowly for several minutes. The following paragraph is called the "rainbow passage." Reading it will result in a wide range of facial movements, and thus be useful to satisfy this requirement. Alternative passages which serve the same purpose may also be used.

(VI) Jogging in place.

(VII) Breathe normally.

"Rainbow Passage."

When the sunlight strikes raindrops in the air, they act like a prism and form a rainbow. The rainbow is a division of white light into many beautiful colors. These take the shape of a long round arch, with its path high above, and its two ends apparently beyond the horizon. There is, according to legend, a boiling pot of gold at one end. People look, but no one ever finds it. When a man looks for something beyond his reach, his friends say he is looking for the pot of gold at the end of the rainbow.

(K) At the beginning of each exercise, the aerosol concentration shall be replenished using one-half the number of squeezes as initially described in (b)(iii)(I) of this subsection.

(L) The test subject shall indicate to the test conductor if at any time during the fit test the taste of saccharin is detected.

(M) If the saccharin is detected the fit is deemed unsatisfactory and a different respirator shall be tried.

(N) At least two facepieces shall be selected by the saccharin test protocol. The test subject shall be given the opportunity to wear them for one week to choose the one which is more comfortable to wear.

(O) Successful completion of the test protocol shall allow the use of the half mask tested respirator in contaminated atmospheres up to 2 f/cc of asbestos. In other words this protocol may be used to assign protection factors no higher than ten.

(P) The test shall not be conducted if there is any hair growth between the skin and the facepiece sealing surface.

(Q) If hair growth or apparel interfere with a satisfactory fit, then they shall be altered or removed so as to eliminate interference and allow a satisfactory fit. If a satisfactory fit is still not attained, the test subject must use a positive-pressure respirator such as powered air-purifying respirators, supplied-air respirator, or self-contained breathing apparatus.

(R) If a test subject exhibits difficulty in breathing during the tests, she or he shall be referred to a physician trained in respirator diseases or pulmonary medicine to determine whether the test subject can wear a respirator while performing her or his duties.

(S) Qualitative fit testing shall be repeated at least every six months.

(T) In addition, because the sealing of the respirator may be affected, qualitative fit testing shall be repeated immediately when the test subject has a:

(I) Weight change of twenty pounds or more,

(II) Significant facial scarring in the area of the facepiece seal,

(III) Significant dental changes; i.e., multiple extractions without prosthesis, or acquiring dentures,

(IV) Reconstructive or cosmetic surgery, or

(V) Any other condition that may interfere with facepiece sealing.

(iv) Recordkeeping.

A summary of all test results shall be maintained in each office for three years. The summary shall include:

(A) Name of test subject.

(B) Date of testing.

(C) Name of test conductor.

(D) Respirators selected (indicate manufacturer, model, size and approval number).

(E) Testing agent.

(c) Irritant fume protocol.

(i) Respirator selection.

Respirators shall be selected as described in (a)(ii) of this subsection, except that each respirator shall be equipped with a high-efficiency cartridge.

(ii) Fit test.

(A) The test subject shall be allowed to smell a weak concentration of the irritant smoke to familiarize the subject with the characteristic odor.

(B) The test subject shall properly don the respirator selected as above, and wear it for at least ten minutes before starting the fit test.

(C) The test conductor shall review this protocol with the test subject before testing.

(D) The test subject shall perform the conventional positive pressure and negative pressure fit checks (see ANSI Z88.2 1980). Failure of either check shall be cause to select an alternate respirator.

(E) Break both ends of a ventilation smoke tube containing stannic oxychloride, such as the MSA part #5645, or equivalent. Attach a short length of tubing to one end of the smoke tube. Attach the other end of the smoke tube to a low pressure air pump set to deliver two hundred milliliters per minute.

(F) Advise the test subject that the smoke can be irritating to the eyes and instruct the subject to keep the eyes closed while the test is performed.

(G) The test conductor shall direct the stream of irritant smoke from the tube towards the face seal area of the test subject. The person conducting the test shall begin with the tube at least twelve inches from the facepiece and gradually move to within one inch, moving around the whole perimeter of the mask.

(H) The test subject shall be instructed to do the following exercises while the respirator is being challenged by the smoke. Each exercise shall be performed for one minute.

(I) Breathe normally.

(II) Breathe deeply. Be certain breaths are deep and regular.

(III) Turn head all the way from one side to the other. Be certain movement is complete. Inhale on each side. Do not bump the respirator against the shoulders.

(IV) Nod head up and down. Be certain motions are complete and made every second. Inhale when head is in the full up position (looking toward ceiling). Do not bump the respirator against the chest.

(V) Talking. Talk aloud and slowly for several minutes. The following paragraph is called the "rainbow passage." Repeating it after the test conductor (keeping eyes closed) will result in a wide range of facial movements, and thus be useful to satisfy this requirement. Alternative passages which serve the same purpose may also be used.

"Rainbow Passage."

When the sunlight strikes raindrops in the air, they act like a prism and form a rainbow. The rainbow is a division of white light into many beautiful colors. These take the shape of a long round arch, with its path high above, and its two ends apparently beyond the horizon. There is, according to legend, a boiling pot of gold at one end. People look, but no one ever finds it. When a man looks for something beyond his reach, his friends say he is looking for the pot of gold at the end of the rainbow.

(VI) Jogging in place.

(VII) Breathe normally.

(I) The test subject shall indicate to the test conductor if the irritant smoke is detected. If smoke is detected, the

test conductor shall stop the test. In this case, the tested respirator is rejected and another respirator shall be selected.

(J) Each test subject passing the smoke test (i.e., without detecting the smoke) shall be given a sensitivity check of smoke from the same tube to determine if the test subject reacts to the smoke. Failure to evoke a response shall void the fit test.

(K) This fit test protocol, (c)(ii)(D), (I), and (J) of this subsection, shall be performed in a location with exhaust ventilation sufficient to prevent general contamination of the testing area by the test agents.

(L) At least two facepieces shall be selected by the irritant fume test protocol. The test subject shall be given the opportunity to wear them for one week to choose the one which is more comfortable to wear.

(M) Respirators successfully tested by the protocol may be used in contaminated atmospheres up to 2 f/cc of asbestos.

(N) The test shall not be conducted if there is any hair growth between the skin and the facepiece sealing surface.

(O) If hair growth or apparel interfere with a satisfactory fit, then they shall be altered or removed so as to eliminate interference and allow a satisfactory fit. If a satisfactory fit is still not attained, the test subject must use a positive-pressure respirator such as powered air-purifying respirators, supplied-air respirator, or self-contained breathing apparatus.

(P) If a test subject exhibits difficulty in breathing during the tests, she or he shall be referred to a physician trained in respirator diseases or pulmonary medicine to determine whether the test subject can wear a respirator while performing her or his duties.

(Q) Qualitative fit testing shall be repeated at least every six months.

(R) In addition, because the sealing of the respirator may be affected, qualitative fit testing shall be repeated immediately when the test subject has a:

(I) Weight change of twenty pounds or more,

(II) Significant facial scarring in the area of the facepiece seal,

(III) Significant dental changes; i.e., multiple extractions without prosthesis, or acquiring dentures,

(IV) Reconstructive or cosmetic surgery, or

(V) Any other condition that may interfere with facepiece sealing.

(iii) Recordkeeping.

A summary of all test results shall be maintained in each office for three years. The summary shall include:

(A) Name of test subject.

(B) Date of testing.

(C) Name of test conductor.

(D) Respirators selected (indicate manufacturer, model, size and approval number).

(E) Testing agent.

(2) Quantitative fit test procedures.

(a) General.

(i) The method applies to the negative-pressure unpowered air-purifying respirators only.

(ii) The employer shall assign one individual who shall assume the full responsibility for implementing the respirator quantitative fit test program.

(b) Definition.

(i) "Quantitative fit test" means the measurement of the effectiveness of a respirator seal in excluding the ambient atmosphere. The test is performed by dividing the measured concentration of challenge agent in a test chamber by the measured concentration of the challenge agent inside the respirator facepiece when the normal air-purifying element has been replaced by an essentially perfect purifying element.

(ii) "Challenge agent" means the air contaminant introduced into a test chamber so that its concentration inside and outside the respirator may be compared.

(iii) "Test subject" means the person wearing the respirator for quantitative fit testing.

(iv) "Normal standing position" means standing erect and straight with arms down along the sides and looking straight ahead.

(v) "Fit factor" means the ratio of challenge agent concentration outside with respect to the inside of a respirator inlet covering (facepiece or enclosure).

(c) Apparatus.

(i) Instrumentation. Corn oil, sodium chloride or other appropriate aerosol generation, dilution, and measurement systems shall be used for quantitative fit test.

(ii) Test chamber. The test chamber shall be large enough to permit all test subjects to freely perform all required exercises without distributing the challenge agent concentration or the measurement apparatus. The test chamber shall be equipped and constructed so that the challenge agent is effectively isolated from the ambient air yet uniform in concentration throughout the chamber.

(iii) When testing air-purifying respirators, the respirator shall be equipped with a cartridge or canister approved for removal of the test agent, or with a high efficiency particulate filter. Only approved assemblies shall be tested.

(iv) The sampling instrument shall be selected so that a strip chart record may be made of the test showing the rise and fall of challenge agent concentration with each inspiration and expiration at fit factors of at least two thousand.

(v) The combination of substitute air-purifying elements (if any), challenge agent, and challenge agent concentration in the test chamber shall be such that the test subject is not exposed in excess of PEL to the challenge agent at any time during the testing process.

(vi) The sampling port on the test specimen respirator shall be placed and constructed so that there is no detectable leak around the port, a free air flow is allowed into the sampling line at all times and so there is no interference with the fit or performance of the respirator.

(vii) The test chamber and test set-up shall permit the person administering the test to observe one test subject inside the chamber during the test.

(viii) The equipment generating the challenge atmosphere shall maintain the concentration of challenge

agent constant within a ten percent variation for the duration of the test.

(ix) The time lag (interval between an event and its being recorded on the strip chart) of the instrumentation may not exceed two seconds.

(x) The tubing for the test chamber atmosphere and for the respirator sampling port shall be the same diameter, length and material. It shall be kept as short as possible. The smallest diameter tubing recommended by the manufacturer shall be used.

(xi) The exhaust flow from the test chamber shall pass through a high-efficiency filter before release to the room.

(xii) When sodium chloride aerosol is used, the relative humidity inside the test chamber shall not exceed fifty percent.

(d) Procedural requirements.

(i) The fitting of half-mask respirators should be started with those having multiple sizes and a variety of interchangeable cartridges and canisters such as the MSA Comfo II-M, North M, Survivair M, A-O M, or Scott-M. Use either of the tests outlined below to assure that the facepiece is properly adjusted.

(A) Positive pressure test. With the exhaust port(s) blocked, the negative pressure of slight inhalation should remain constant for several seconds.

(B) Negative pressure test. With the intake port(s) blocked, the negative pressure slight inhalation should remain constant for several seconds.

(ii) After a facepiece is adjusted, the test subject shall wear the facepiece for at least five minutes before conducting a qualitative test by using either of the methods described below and using the exercise regime described in (e)(i) through (v) of this subsection.

(A) Isoamyl acetate test. When using organic vapor cartridges, the test subject who can smell the odor should be unable to detect the odor of isoamyl acetate squirted into the air near the most vulnerable portions of the facepiece seal. In a location which is separated from the test area, the test subject shall be instructed to close her/his eyes during the test period. A combination cartridge or canister with organic vapor and high-efficiency filters shall be used when available for the particular mask being tested. The test subject shall be given an opportunity to smell the odor of isoamyl acetate before the test is conducted.

(B) Irritant fume test. When using high-efficiency filters, the test subject should be unable to detect the odor of irritant fume (stannic chloride or titanium tetrachloride ventilation smoke tubes) squirted into the air near the most vulnerable portions of the facepiece seal. The test subject shall be instructed to close her/his eyes during the test period.

(iii) The test subject may enter the quantitative testing chamber only if she or he has obtained a satisfactory fit as stated in (d)(ii) of this subsection.

(iv) Before the subject enters the test chamber, a reasonably stable challenge agent concentration shall be measured in the test chamber.

(v) Immediately after the subject enters the test chamber, the challenge agent concentration inside the



respirator shall be measured to ensure that the peak penetration does not exceed five percent for a half-mask and one percent for a full facepiece.

(vi) A stable challenge agent concentration shall be obtained prior to the actual start of testing.

(A) Respirator restraining straps may not be overtightened for testing. The straps shall be adjusted by the wearer to give a reasonably comfortable fit typical of normal use.

(e) Exercise regime. Prior to entering the test chamber, the test subject shall be given complete instructions as to her/his part in the test procedures. The test subject shall perform the following exercises, in the order given, for each independent test.

(i) Normal breathing (NB). In the normal standing position, without talking, the subject shall breathe normally for at least one minute.

(ii) Deep breathing (DB). In the normal standing position the subject shall do deep breathing for at least one minute pausing so as not to hyperventilate.

(iii) Turning head side to side (SS). Standing in place the subject shall slowly turn his/her head from side between the extreme positions to each side. The head shall be held at each extreme position for at least five seconds. Perform for at least three complete cycles.

(iv) Moving head up and down (UD). Standing in place, the subject shall slowly move his/her head up and down between the extreme position straight up and the extreme position straight down. The head shall be held at each extreme position for at least five seconds. Perform for at least three complete cycles.

(v) Reading (R). The test subject (keeping eyes closed) shall repeat after the test conductor the "rainbow passage" at the end of this section. The subject shall talk slowly and aloud so as to be heard clearly by the test conductor or monitor. The test subject shall read the "rainbow passage" at the end of this section.

(vi) Grimace (G). The test subject shall grimace, smile, frown, and generally contort the face using the facial muscles. Continue for at least fifteen seconds.

(vii) Bend over and touch toes (B). The test subject shall bend at the waist and touch toes and return to upright position. Repeat for at least thirty seconds.

(viii) Jogging in place (J). The test subject shall perform jog in place for at least thirty seconds.

(ix) Normal breathing (NB). Same as exercise (e)(i) of this subsection.

"Rainbow Passage."

When the sunlight strikes raindrops in the air, they act like a prism and form a rainbow. The rainbow is a division of white light into many beautiful colors. These take the shape of a long round arch, with its path high above, and its two ends apparently beyond the horizon. There is, according to legend, a boiling pot of gold at one end. People look, but no one ever finds it. When a man looks for something beyond reach, his friends say he is looking for the pot of gold at the end of the rainbow.

(f) The test shall be terminated whenever any single peak penetration exceeds five percent for half-masks and one percent for full facepieces. The test subject may

be refitted and retested. If two of the three required tests are terminated, the fit shall be deemed inadequate.

(g) Calculation of fit factors.

(i) The fit factor is determined by dividing the average challenge agent concentration in the test chamber by the average challenge agent concentration inside the respirator facepiece for the test exercise.

(ii) The average test chamber concentration is the arithmetic average of the test chamber concentration at the beginning and at the end of the test.

(iii) The average peak concentration of the challenge agent inside the respirator shall be the arithmetic average peak concentrations for each of the nine exercises of the test which are computed as the arithmetic average of the peak concentrations found for each breath during the exercise.

(iv) The average peak concentration for an exercise may be determined graphically if there is not a great variation in the peak concentrations during a single exercise.

(h) Interpretation of test results. The fit factor measured by the quantitative fit testing shall be the lowest of the three fit factors resulting from three independent tests.

(i) Other requirements.

(i) The test subject shall not be permitted to wear a half-mask or full facepiece mask if the minimum fit factor of one hundred or one thousand, respectively, cannot be obtained. If hair growth or apparel interfere with a satisfactory fit, then they shall be altered or removed so as to eliminate interference and allow a satisfactory fit. If a satisfactory fit is still not attained, the test subject must use a positive-pressure respirator such as powered air-purifying respirators, supplied-air respirator, or self-contained breathing apparatus.

(ii) The test shall not be conducted if there is any hair growth between the skin and the facepiece sealing surface.

(iii) If a test subject exhibits difficulty in breathing during the tests, she or he shall be referred to a physician trained in respirator diseases or pulmonary medicine to determine whether the test subject can wear a respirator while performing her or his duties.

(iv) The test subject shall be given the opportunity to wear the assigned respirator for one week. If the respirator does not provide a satisfactory fit during actual use, the test subject may request another QNFT which shall be performed immediately.

(v) A respirator fit factor card shall be issued to the test subject with the following information:

(A) Name.

(B) Date of fit test.

(C) Fit factor obtained for each manufacturer, model and approval number of respirator tested.

(D) Name and signature of the person that conducted the test.

(vi) Filters used for qualitative or quantitative fit testing shall be replaced weekly, whenever increased breathing resistance is encountered, or when the test agent has altered the integrity of the filter media. Organic vapor cartridges/canisters shall be replaced daily

or sooner if there is any indication of breakthrough by the test agent.

(j) In addition, because the sealing of the respirator may be affected, quantitative fit testing shall be repeated immediately when the test subject has a:

- (i) Weight change of twenty pounds or more,
(ii) Significant facial scarring in the area of the face-piece seal,
(iii) Significant dental changes; i.e., multiple extractions without prosthesis, or acquiring dentures,
(iv) Reconstructive or cosmetic surgery, or
(v) Any other condition that may interfere with face-piece sealing.
(k) Recordkeeping.

A summary of all test results shall be maintained for three years. The summary shall include:

- (i) Name of test subject.
(ii) Date of testing.
(iii) Name of the test conductor.
(iv) Fit factors obtained from every respirator tested (indicate manufacturer, model, size and approval number).

[Statutory Authority: Chapter 49.17 WAC. 87-24-051 (Order 87-24), § 296-62-07739, filed 11/30/87. Statutory Authority: RCW 49.17.050(2) and 49.17.040. 87-10-008 (Order 87-06), § 296-62-07739, filed 4/27/87.]

WAC 296-62-07741 Appendix D--Medical questionnaires--Mandatory. This mandatory appendix contains the medical questionnaires that must be administered to all employees who are exposed to asbestos above the action level, and who will therefore be included in their employer's medical surveillance program. Part 1 of the appendix contains the initial medical questionnaire, which must be obtained for all new hires who will be covered by the medical surveillance requirements. Part 2 includes the abbreviated periodical medical questionnaire, which must be administered to all employees who are provided periodic medical examinations under the medical surveillance provisions of the standard.

Part 1
INITIAL MEDICAL QUESTIONNAIRE

1. NAME
2. SOCIAL SECURITY #
3. CLOCK NUMBER
4. PRESENT OCCUPATION
5. PLANT
6. ADDRESS
7. (Zip Code)
8. TELEPHONE NUMBER
9. INTERVIEWER
10. DATE
11. Date of birth
12. Place of birth
13. Sex

14. What is your marital status?
15. Race
16. What is the highest grade completed in school?
(For example 12 years is completion of high school)

OCCUPATIONAL HISTORY

17A. Have you ever worked full time for 6 months or more?
B. Have you ever worked for a year or more in any dusty job?
C. Have you ever been exposed to gas or chemical fumes in your work?
D. What has been your usual occupation or job--the one you have worked at the longest?

Have you ever worked:
E. In a mine?
F. In a quarry?
G. In a foundry?
H. In a pottery?
I. In a cotton, flax or hemp mill?
J. With asbestos?

18. PAST MEDICAL HISTORY

A. Do you consider yourself to be in good health?
B. Have you any defect in vision?
C. Have you any hearing defect?

D. Are you suffering from or have you ever suffered from:
a. Epilepsy (or fits, seizures, convulsions)?
b. Rheumatic fever?
c. Kidney disease?
d. Bladder disease?
e. Diabetes?
f. Jaundice?

19. CHEST COLDS AND CHEST ILLNESSES

19A. If you get a cold, does it usually go to your chest?
20A. During the past 3 years, have you had any chest illnesses that have kept you off work, indoors at home, or in bed?
21. Did you have any lung trouble before the age of 16?

22. Have you ever had any of the following?

1A. Attacks of bronchitis? 1. Yes \_\_\_ 2. No \_\_\_

IF YES TO 1A:

B. Was it confirmed by a doctor? 1. Yes \_\_\_ 2. No \_\_\_  
3. Does not apply \_\_\_

C. At what age was your first attack? Age in years \_\_\_  
Does not apply \_\_\_

2A. Pneumonia? (include broncho-pneumonia) 1. Yes \_\_\_ 2. No \_\_\_

IF YES TO 2A:

B. Was it confirmed by a doctor? 1. Yes \_\_\_ 2. No \_\_\_  
3. Does not apply \_\_\_

C. At what age did you first have it? Age in years \_\_\_  
Does not apply \_\_\_

3A. Hay fever? 1. Yes \_\_\_ 2. No \_\_\_

IF YES TO 3A:

B. Was it confirmed by a doctor? 1. Yes \_\_\_ 2. No \_\_\_  
3. Does not apply \_\_\_

C. At what age did it start? Age in years \_\_\_  
Does not apply \_\_\_

23A. Have you ever had chronic bronchitis? 1. Yes \_\_\_ 2. No \_\_\_

IF YES TO 23A:

B. Do you still have it? 1. Yes \_\_\_ 2. No \_\_\_  
3. Does not apply \_\_\_

C. Was it confirmed by a doctor? 1. Yes \_\_\_ 2. No \_\_\_  
3. Does not apply \_\_\_

D. At what age did it start? Age in years \_\_\_  
Does not apply \_\_\_

24A. Have you ever had emphysema? 1. Yes \_\_\_ 2. No \_\_\_

IF YES TO 24A:

B. Do you still have it? 1. Yes \_\_\_ 2. No \_\_\_  
3. Does not apply \_\_\_

C. Was it confirmed by a doctor? 1. Yes \_\_\_ 2. No \_\_\_  
3. Does not apply \_\_\_

D. At what age did it start? Age in years \_\_\_  
Does not apply \_\_\_

25A. Have you ever had asthma? 1. Yes \_\_\_ 2. No \_\_\_

IF YES TO 25A:

B. Do you still have it? 1. Yes \_\_\_ 2. No \_\_\_  
3. Does not apply \_\_\_

C. Was it confirmed by a doctor? 1. Yes \_\_\_ 2. No \_\_\_  
3. Does not apply \_\_\_

D. At what age did it start? Age in years \_\_\_  
Does not apply \_\_\_

E. If you no longer have it, at what age did it stop? Age stopped \_\_\_  
Does not apply \_\_\_

26. Have you ever had:

A. Any other chest illness? 1. Yes \_\_\_ 2. No \_\_\_

If yes, please specify \_\_\_\_\_

B. Any chest operations? 1. Yes \_\_\_ 2. No \_\_\_

If yes, please specify \_\_\_\_\_

C. Any chest injuries? 1. Yes \_\_\_ 2. No \_\_\_

If yes, please specify \_\_\_\_\_

27A. Has a doctor ever told you that you had heart trouble? 1. Yes \_\_\_ 2. No \_\_\_

IF YES TO 27A:

B. Have you ever had treatment for heart trouble in the past 10 years? 1. Yes \_\_\_ 2. No \_\_\_  
3. Does not apply \_\_\_

28A. Has a doctor ever told you that you had high blood pressure? 1. Yes \_\_\_ 2. No \_\_\_

IF YES TO 28A:

B. Have you had any treatment for high blood pressure (hypertension) in the past 10 years? 1. Yes \_\_\_ 2. No \_\_\_  
3. Does not apply \_\_\_

29. When did you last have your chest x-rayed? (Year) \_\_\_ 25 \_\_\_ 26 \_\_\_ 27 \_\_\_ 28 \_\_\_

30. Where did you last have your chest x-rayed (if known)? \_\_\_\_\_  
What was the outcome? \_\_\_\_\_

FAMILY HISTORY

31. Were either of your natural parents ever told by a doctor that they had a chronic lung condition such as:

	FATHER			MOTHER		
	1. Yes	2. No	3. Don't Know	1. Yes	2. No	3. Don't Know
A. Chronic Bronchitis?	___	___	___	___	___	___
B. Emphysema?	___	___	___	___	___	___
C. Asthma?	___	___	___	___	___	___
D. Lung cancer?	___	___	___	___	___	___
E. Other chest conditions?	___	___	___	___	___	___
F. Is parent currently alive?	___	___	___	___	___	___
G. Please specify	___	Age if living ___ Age at death ___ Don't know	___	Age if living ___ Age at death ___ Don't know	___	___
H. Please specify cause of death	_____					

COUGH

32A. Do you usually have a cough? (Count a cough with first smoke or on first going out of doors. Exclude clearing of throat.) (If no, skip to question 32C.) 1. Yes \_\_\_ 2. No \_\_\_

B. Do you usually cough as much as 4 to 6 times a day 4 or more days out of the week? 1. Yes \_\_\_ 2. No \_\_\_

C. Do you usually cough at all on getting up or first thing in the morning? 1. Yes \_\_\_ 2. No \_\_\_

D. Do you usually cough at all during the rest of the day or at night? 1. Yes \_\_\_ 2. No \_\_\_

IF YES TO ANY OF ABOVE (32A, B, C, OR D), ANSWER THE FOLLOWING. IF NO TO ALL, CHECK DOES NOT APPLY AND SKIP TO NEXT PAGE

E. Do you usually cough like this on most days for 3 consecutive months or more during the year? 1. Yes \_\_\_ 2. No \_\_\_  
3. Does not apply \_\_\_

F. For how many years have you had the cough? Number of years \_\_\_  
Does not apply \_\_\_

33A. Do you usually bring up phlegm from your chest? (Count phlegm with the first smoke or on first going out of doors. Exclude phlegm from the nose. Count swallowed phlegm.) (If no, skip to 33C.) 1. Yes \_\_\_ 2. No \_\_\_

B. Do you usually bring up phlegm like this as much as twice a day 4 or more days out of the week? 1. Yes \_\_\_ 2. No \_\_\_

C. Do you usually bring up phlegm at all on getting up or first thing in the morning? 1. Yes \_\_\_ 2. No \_\_\_

D. Do you usually bring up phlegm at all during the rest of the day or at night? 1. Yes \_\_\_ 2. No \_\_\_

IF YES TO ANY OF THE ABOVE (33A, B, C, OR D), ANSWER THE FOLLOWING: IF NO TO ALL, CHECK DOES NOT APPLY AND SKIP TO 34A.

E. Do you bring up phlegm like this on most days for 3 consecutive months or more during the year? 1. Yes \_\_\_ 2. No \_\_\_ 3. Does not apply \_\_\_

F. For how many years have you had trouble with phlegm? Number of years \_\_\_ Does not apply \_\_\_

EPISODES OF COUGH AND PHLEGM

34A. Have you had periods or episodes of (increased\*) cough and phlegm lasting for 3 weeks or more each year? 1. Yes \_\_\_ 2. No \_\_\_ \*(For persons who usually have cough and/or phlegm.)

IF YES TO 34A:

B. For how long have you had at least 1 such episode per year? Number of years \_\_\_ Does not apply \_\_\_

WHEEZING

35A. Does your chest ever sound wheezy or whistling: 1. When you have a cold? 2. Occasionally apart from colds? 3. Most days or nights? 1. Yes \_\_\_ 2. No \_\_\_

IF YES TO 1, 2, OR 3 IN 35A:

B. For how many years has this been present? Number of years \_\_\_ Does not apply \_\_\_

36A. Have you ever had an attack of wheezing that has made you feel short of breath? 1. Yes \_\_\_ 2. No \_\_\_

IF YES TO 36A:

B. How old were you when you had your first such attack? Age in years \_\_\_ Does not apply \_\_\_

C. Have you had 2 or more such episodes? 1. Yes \_\_\_ 2. No \_\_\_ 3. Does not apply \_\_\_

D. Have you ever required medicine or treatment for the(se) attack(s)? 1. Yes \_\_\_ 2. No \_\_\_ 3. Does not apply \_\_\_

BREATHLESSNESS

37. If disabled from walking by any condition other than heart or lung disease, please describe and proceed to question 39A. Nature of condition(s) \_\_\_\_\_

38A. Are you troubled by shortness of breath when hurrying on the level or walking up a slight hill? 1. Yes \_\_\_ 2. No \_\_\_

IF YES TO 38A:

B. Do you have to walk slower than people of your age on the level because of breathlessness? 1. Yes \_\_\_ 2. No \_\_\_ 3. Does not apply \_\_\_

C. Do you ever have to stop for breath when walking at your own pace on the level? 1. Yes \_\_\_ 2. No \_\_\_ 3. Does not apply \_\_\_

D. Do you ever have to stop for breath after walking about 100 yards (or after a few minutes) on the level? 1. Yes \_\_\_ 2. No \_\_\_ 3. Does not apply \_\_\_

E. Are you too breathless to leave the house or breathless on dressing or climbing one flight of stairs? 1. Yes \_\_\_ 2. No \_\_\_ 3. Does not apply \_\_\_

TOBACCO SMOKING

39A. Have you ever smoked cigarettes? (No means less than 20 packs of cigarettes or 12 oz. of tobacco in a lifetime or less than 1 cigarette a day for 1 year.) 1. Yes \_\_\_ 2. No \_\_\_

IF YES TO 39A:

B. Do you now smoke cigarettes (as of one month ago)? 1. Yes \_\_\_ 2. No \_\_\_ 3. Does not apply \_\_\_

C. How old were you when you first started regular cigarette smoking? Age in years \_\_\_ Does not apply \_\_\_

D. If you have stopped smoking cigarettes completely, how old were you when you stopped? Aged stopped \_\_\_ Check if still smoking \_\_\_ Does not apply \_\_\_

E. How many cigarettes do you smoke per day now? Cigarettes per day \_\_\_ Does not apply \_\_\_

F. On the average of the entire time you smoked, how many cigarettes did you smoke per day? Cigarettes per day \_\_\_ Does not apply \_\_\_

G. Do you or did you inhale the cigarette smoke? 1. Does not apply \_\_\_ 2. Not at all \_\_\_ 3. Slightly \_\_\_ 4. Moderately \_\_\_ 5. Deeply \_\_\_

40A. Have you ever smoked a pipe regularly? (Yes means more than 12 ounces of tobacco in a lifetime.) 1. Yes \_\_\_ 2. No \_\_\_

IF YES TO 40A:

FOR PERSONS WHO HAVE EVER SMOKED A PIPE

B. 1. How old were you when you started to smoke a pipe regularly? Age \_\_\_

2. If you have stopped smoking a pipe completely, how old were you when you stopped? Aged stopped \_\_\_ Check if still smoking pipe \_\_\_ Does not apply \_\_\_

C. On the average over the entire time you smoked a pipe, how much pipe tobacco did you smoke per week? \_\_\_ oz. per week (a standard pouch of tobacco contains 1-1/2 ounces) Does not apply \_\_\_

D. How much pipe tobacco are you smoking now? oz. per week \_\_\_ Not currently smoking a pipe \_\_\_

E. Do you or did you inhale the pipe smoke? 1. Never smoked \_\_\_ 2. Not at all \_\_\_ 3. Slightly \_\_\_ 4. Moderately \_\_\_ 5. Deeply \_\_\_

41A. Have you ever smoked cigars regularly? (Yes means more than 1 cigar a week for a year.) 1. Yes \_\_\_ 2. No \_\_\_

IF YES TO 41A:

FOR PERSONS WHO HAVE EVER SMOKED CIGARS

B. 1. How old were you when you started smoking cigars regularly? Age \_\_\_

2. If you have stopped smoking cigars completely, how old were you when you stopped? Aged stopped \_\_\_ Check if still smoking cigars \_\_\_ Does not apply \_\_\_

C. On the average over the entire time you smoked cigars, how many cigars did you smoke per week? Cigars per week \_\_\_ Does not apply \_\_\_

D. How many cigars are you smoking per week now? Cigars per week \_\_\_ Check if not smoking cigars currently \_\_\_

E. Do you or did you inhale the cigar smoke? 1. Never smoked \_\_\_ 2. Not at all \_\_\_ 3. Slightly \_\_\_ 4. Moderately \_\_\_ 5. Deeply \_\_\_

Signature \_\_\_\_\_ Date \_\_\_\_\_

Part 2 PERIODIC MEDICAL QUESTIONNAIRE

1. NAME \_\_\_\_\_

2. SOCIAL SECURITY # \_\_\_\_\_ 1 2 3 4 5 6 7 8 9

3. CLOCK NUMBER \_\_\_\_\_ 10 11 12 13 14 15

4. PRESENT OCCUPATION \_\_\_\_\_

5. PLANT \_\_\_\_\_

6. ADDRESS \_\_\_\_\_

7. \_\_\_\_\_  
(Zip Code)

8. TELEPHONE NUMBER \_\_\_\_\_

9. INTERVIEWER \_\_\_\_\_

10. DATE \_\_\_\_\_  
16 17 18 19 20 21

	Yes or No	Further Comment on Positive Answers
Pneumonia	___	
Tuberculosis	___	
Chest surgery	___	
Other lung Problems	___	
Heart disease	___	
Do you have:		

11. What is your marital status?  
 1. Single \_\_\_ 4. Separated/Divorced \_\_\_  
 2. Married \_\_\_  
 3. Widowed \_\_\_

	Yes or No	Further Comment on Positive Answers
Frequent colds	___	
Chronic cough	___	
Shortness of breath when walking or climbing one flight of stairs	___	
Do you: Wheeze	___	
Cough up phlegm	___	
Smoke cigarettes	___	Packs per day ___ How many years ___

12. OCCUPATIONAL HISTORY

12A. In the past year, did you work full time (30 hours per week or more) for 6 months or more?  
 1. Yes \_\_\_ 2. No \_\_\_

IF YES TO 12A:

12B. In the past year, did you work in a dusty job?  
 1. Yes \_\_\_ 2. No \_\_\_  
 3. Does not apply \_\_\_

12C. Was dust exposure: 1. Mild \_\_\_ 2. Moderate \_\_\_ 3. Severe \_\_\_

12D. In the past year, were you exposed to gas or chemical fumes in your work?  
 1. Yes \_\_\_ 2. No \_\_\_

12E. Was exposure: 1. Mild \_\_\_ 2. Moderate \_\_\_ 3. Severe \_\_\_

12F. In the past year, what was your:  
 1. Job/occupation? \_\_\_\_\_  
 2. Position/job title? \_\_\_\_\_

13. RECENT MEDICAL HISTORY

13A. Do you consider yourself to be in good health?  
 Yes \_\_\_ No \_\_\_  
 If NO, state reason \_\_\_\_\_

13B. In the past year, have you developed:

	Yes	No
Epilepsy?	___	___
Rheumatic fever?	___	___
Kidney disease?	___	___
Bladder disease?	___	___
Diabetes?	___	___
Jaundice?	___	___
Cancer?	___	___

14. CHEST COLDS AND CHEST ILLNESS

14A. If you get a cold, does it usually go to your chest? (Usually means more than 1/2 the time.)  
 1. Yes \_\_\_ 2. No \_\_\_  
 3. Don't get colds \_\_\_

15A. During the past year, have you had any chest illnesses that have kept you off work, indoors at home, or in bed?  
 1. Yes \_\_\_ 2. No \_\_\_  
 3. Does not apply \_\_\_

IF YES TO 15A:

15B. Did you produce phlegm with any of these chest illnesses?  
 1. Yes \_\_\_ 2. No \_\_\_  
 3. Does not apply \_\_\_

15C. In the past year, how many such illnesses with (increased) phlegm did you have which lasted a week or more?  
 Number of illnesses \_\_\_  
 No such illnesses \_\_\_

16. RESPIRATORY SYSTEM

In the past year have you had:

	Yes or No	Further Comment on Positive Answers
Asthma	___	
Bronchitis	___	
Hay fever	___	
Other allergies	___	

Date \_\_\_\_\_ Signature \_\_\_\_\_

[Statutory Authority: Chapter 49.17 WAC. 87-24-051 (Order 87-24), § 296-62-07741, filed 11/30/87. Statutory Authority: RCW 49.17.050(2) and 49.17.040. 87-10-008 (Order 87-06), § 296-62-07741, filed 4/27/87.]

**WAC 296-62-07743 Appendix E--Interpretation and classification of chest roentgenograms--Mandatory.**

(1) Chest roentgenograms shall be interpreted and classified in accordance with a professionally accepted classification system and recorded on an interpretation form following the format of the CDC/NIOSH (M) 2.8 form. As a minimum, the content within the bold lines of this form (items one through four) shall be included. This form is not to be submitted to NIOSH.

(2) Roentgenograms shall be interpreted and classified only by a B-reader, a board eligible/certified radiologist, or an experienced physician with known expertise in pneumoconioses.

(3) All interpreters, whenever interpreting chest roentgenograms made under this section, shall have immediately available for reference a complete set of the ILO-U/C International Classification of Radiographs for Pneumoconioses, 1980.

[Statutory Authority: Chapter 49.17 WAC. 87-24-051 (Order 87-24), § 296-62-07743, filed 11/30/87. Statutory Authority: RCW 49.17.050(2) and 49.17.040. 87-10-008 (Order 87-06), § 296-62-07743, filed 4/27/87.]

**WAC 296-62-07745 Appendix F--Work practices and engineering controls for automotive brake repair operations--Nonmandatory.**

This appendix is intended as guidance for employers in the automotive brake and clutch repair industry who wish to reduce their employees' asbestos exposures during repair operations to levels below the new standard's action level (0.1 f/cc). WISHA believes that employers in this industry sector are likely to be able to reduce their employees' exposures to asbestos by employing the engineering and work practice controls described in subsections (1) and (2) of this section. Those employers who choose to use these controls and who achieve exposures below the action level will thus be able to avoid any burden that might be

imposed by complying with such requirements as medical surveillance, recordkeeping, training, respiratory protection, and regulated areas, which are triggered when employee exposures exceed the action level or permissible exposure limits.

Asbestos exposure in the automotive brake and clutch repair industry occurs primarily during the replacement of clutch plates and brake pads, shoes, and linings. Asbestos fibers may become airborne when an automotive mechanic removes the asbestos-containing residue that has been deposited as brakes and clutches wear. Employee exposures to asbestos occur during the cleaning of the brake drum or clutch housing.

WISHA believes that employers engaged in brake repair operations who implement any of the work practices and engineering controls described in subsections (1) and (2) of this section may be able to reduce their employees' exposures to levels below the action level (0.1 fiber/cc). These control methods and the relevant record evidence on these and other methods are described in the following sections.

(1) Enclosed cylinder/HEPA vacuum system method.

The enclosed cylinder-vacuum system used in one of the facilities visited by representatives of the National Institute for Occupational Safety and Health (NIOSH) during a health hazard evaluation of brake repair facilities consists of three components:

(a) A wheel-shaped cylinder designed to cover and enclose the wheel assembly;

(b) A compressed-air hose and nozzle that fits into a port in the cylinder; and

(c) A HEPA-filtered vacuum used to evacuate airborne dust generated within the cylinder by the compressed air.

To operate the system, the brake assembly is enclosed in a cylinder that has viewing ports to provide visibility and cotton sleeves through which the mechanic can handle the brake assembly parts. The cylinder effectively isolates asbestos dust in the drum from the mechanic's breathing zone. One company manufactures the brake assembly isolation cylinder. The cylinder is equipped with built-in compressed-air guns and a connection for a vacuum cleaner equipped with a high efficiency particulate air (HEPA) filter. This type of filter is capable of removing all particles greater than 0.3 microns from the air. When the vacuum cleaner's filter is full, it must be replaced according to the manufacturer's instruction, and appropriate HEPA-filtered dual cartridge respirators should be worn during the process. The filter of the vacuum cleaner is assumed to be contaminated with asbestos fibers and should be handled carefully, wetted with a fine mist of water, placed immediately in a labelled plastic bag, and disposed of properly. When the cylinder is in place around the brake assembly and the HEPA vacuum is connected, compressed air is blown into the cylinder to loosen the residue from the brake assembly parts. The vacuum then evacuates the loosened material from within the cylinder, capturing the airborne material on the HEPA filter.

The HEPA vacuum system can be disconnected from the brake assembly isolation cylinder when the cylinder

is not being used. The HEPA vacuum can then be used for clutch facing work, grinding, or other routine cleaning.

(2) Compressed air/solvent system method.

A compressed-air hose fitted at the end with a bottle of solvent can be used to loosen the asbestos-containing residue and to capture the resulting airborne particles in the solvent mist. The mechanic should begin spraying the asbestos-contaminated parts with the solvent at a sufficient distance to ensure that the asbestos particles are not dislodged by the velocity of the solvent spray. After the asbestos particles are thoroughly wetted, the spray may be brought closer to the parts and the parts may be sprayed as necessary to remove grease and other material. The automotive parts sprayed with the mist are then wiped with a rag, which must then be disposed of appropriately. Rags should be placed in a labelled plastic bag or other container while they are still wet. This ensures that the asbestos fibers will not become airborne after the brake and clutch parts have been cleaned. (If cleanup rags are laundered rather than disposed of, they must be washed using methods appropriate for the laundering of asbestos-contaminated materials.)

WISHA believes that a variant of this compressed-air/solvent mist process offers advantages over the compressed-air/solvent mist technique discussed above, both in terms of costs and employee protection. The variant involves the use of spray cans filled with any of several solvent cleaners commercially available from auto supply stores. Spray cans of solvent are inexpensive, readily available, and easy to use. These cans will also save time, because no solvent delivery system has to be assembled, i.e., no compressed-air hose/mister ensemble. OSHA believes that a spray can will deliver solvent to the parts to be cleaned with considerably less force than the alternative compressed-air delivery system described above, and will thus generate fewer airborne asbestos fibers than the compressed-air method. The agency therefore believes that the exposure levels of automotive repair mechanics using the spray can/solvent mist process will be even lower than the exposures reported by NIOSH for the compressed-air/solvent mist system (0.08 f/cc).

(3) Information on the effectiveness of various control measures.

The amount of airborne asbestos generated during brake and clutch repair operations depends on the work practices and engineering controls used during the repair or removal activity.

(a) Prohibited methods.

The use of compressed air to blow the asbestos-containing residue off the surface of the brake drum removes the residue effectively but simultaneously produces an airborne cloud of asbestos fibers. According to NIOSH, the peak exposures of mechanics using this technique were as high as fifteen fibers/cc, and eight-hour TWA exposures ranged from 0.03 to 0.19 f/cc.

Dr. William J. Nicholson of the Mount Sinai School of Medicine cited data from Knight and Hickish (1970) that indicated that the concentration of asbestos ranged



from 0.84 to 5.35 f/cc over a sixty-minute sampling period when compressed air was being used to blow out the asbestos-containing residue from the brake drum. In the same study, a peak concentration of eighty-seven f/cc was measured for a few seconds during brake cleaning performed with compressed air. Rohl et al. (1976) measured area concentrations (of unspecified duration) within three to five feet of operations involving the cleaning of brakes with compressed air and obtained readings ranging from 6.6 to 29.8 f/cc. Because of the high exposure levels that result from cleaning brake and clutch parts using compressed air, WISHA has prohibited this practice in the revised standard.

(b) Ineffective methods.

When dry brushing was used to remove the asbestos-containing residue from the brake drums and wheel assemblies, peak exposures measured by NIOSH ranged from 0.61 to 0.81 f/cc, while eight-hour TWA levels were at the new standard's permissible exposure limit (PEL) of 0.2 f/cc. Rohl and his colleagues collected area samples one to three feet from a brake cleaning operation being performed with a dry brush, and measured concentrations ranging from 1.3 to 3.6 f/cc; however, sampling times and TWA concentrations were not presented in the Rohl et al. study.

When a brush wetted with water, gasoline, or Stoddart solvent was used to clean the asbestos-containing residue from the affected parts, exposure levels (eight-hour TWAs) measured by NIOSH also exceeded the new 0.2 f/cc PEL, and peak exposures ranged as high as 2.62 f/cc.

(c) Preferred methods.

Use of an engineering control system involving a cylinder that completely encloses the brake shoe assembly and a high efficiency particulate air (HEPA) filter-equipped vacuum produced eight-hour TWA employee exposures of 0.01 f/cc and peak exposures ranging from nondetectable to 0.07 f/cc. (Because this system achieved exposure levels below the standard's action level, it is described in detail above.) Data collected by the Mount Sinai Medical Center for Nilfisk of America, Inc., the manufacturer of the brake assembly enclosure system, showed that for two of three operations sampled, the exposure of mechanics to airborne asbestos fibers was nondetectable. For the third operator sampled by Mt. Sinai researchers, the exposure was 0.5 f/cc, which the authors attributed to asbestos that had contaminated the operator's clothing in the course of previous brake repair operations performed without the enclosed cylinder/vacuum system.

Some automotive repair facilities use a compressed-air hose to apply a solvent mist to remove the asbestos-containing residue from the brake drums before repair. The NIOSH data indicated that mechanics employing this method experienced exposures (eight-hour TWAs) of 0.8 f/cc, with peaks of 0.25 to 0.68 f/cc. This technique, and a variant of it, that WISHA believes is both less costly and more effective in reducing employee exposures, is described in greater detail in subsections (1) and (2) of this section.

(4) Summary.

In conclusion, WISHA believes that it is likely that employers in the brake and clutch repair industry will be able to avail themselves of the action level trigger built into the revised standard if they conscientiously employ one of the three control methods described above: The enclosed cylinder/HEPA vacuum system, the compressed air/solvent method, or the spray can/solvent mist system.

[Statutory Authority: Chapter 49.17 RCW. 89-11-035 (Order 89-03), § 296-62-07745, filed 5/15/89, effective 6/30/89; 87-24-051 (Order 87-24), § 296-62-07745, filed 11/30/87. Statutory Authority: RCW 49.17.050(2) and 49.17.040. 87-10-008 (Order 87-06), § 296-62-07745, filed 4/27/87.]

**WAC 296-62-07747 Appendix G—Substance technical information for asbestos—Nonmandatory. (1) Substance identification.**

(a) Substance: "Asbestos" is the name of a class of magnesium-silicate minerals that occur in fibrous form. Minerals that are included in this group are chrysotile, crocidolite, amosite, tremolite asbestos, anthophyllite asbestos, and actinolite asbestos.

(b) Asbestos is used in the manufacture of heat-resistant clothing, automotive brake and clutch linings, and a variety of building materials including floor tiles, roofing felts, ceiling tiles, asbestos-cement pipe and sheet, and fire-resistant drywall. Asbestos is also present in pipe and boiler insulation materials, and in sprayed-on materials located on beams, in crawlspaces, and between walls.

(c) The potential for a product containing asbestos, tremolite, anthophyllite, and actinolite to release breathable fibers depends on its degree of friability. Friable means that the material can be crumbled with hand pressure and is therefore likely to emit fibers. The fibrous or fluffy sprayed-on materials used for fireproofing, insulation, or sound proofing are considered to be friable, and they readily release airborne fibers if disturbed. Materials such as vinyl-asbestos floor tile or roofing felts are considered nonfriable and generally do not emit airborne fibers unless subjected to sanding or sawing operations. Asbestos-cement pipe or sheet can emit airborne fibers if the materials are cut or sawed, or if they are broken during demolition operations.

(d) Permissible exposure: Exposure to airborne asbestos fibers may not exceed 0.2 fibers per cubic centimeter of air (0.2 f/cc) averaged over the eight-hour workday (time weighted average), or 0.1 fibers per cubic centimeter of air (0.1 f/cc) during any fifteen minute period, (excursion limit).

(2) Health hazard data.

(a) Asbestos can cause disabling respiratory disease and various types of cancers if the fibers are inhaled. Inhaling or ingesting fibers from contaminated clothing or skin can also result in these diseases. The symptoms of these diseases generally do not appear for twenty or more years after initial exposure.

(b) Exposure to asbestos has been shown to cause lung cancer, mesothelioma, and cancer of the stomach and colon. Mesothelioma is a rare cancer of the thin membrane lining of the chest and abdomen. Symptoms of

mesothelioma include shortness of breath, pain in the walls of the chest, and/or abdominal pain.

(3) Respirators and protective clothing.

(a) Respirators: You are required to wear a respirator when performing tasks that result in asbestos exposure that exceeds 0.2 fibers per cubic centimeter of air (0.2 f/cc) as an eight-hour time weighted average and/or 1.0 fiber per cubic centimeter (1 f/cc) during any 15 minute period (excursion limit). These conditions can occur while your employer is in the process of installing engineering controls to reduce asbestos exposure, or where engineering controls are not feasible to reduce asbestos exposure. Air-purifying respirators equipped with a high-efficiency particulate air (HEPA) filter can be used where airborne asbestos fiber concentrations do not exceed 2 f/cc; otherwise, air-supplied, positive-pressure, full facepiece respirators must be used. Disposable respirators or dust masks are not permitted to be used for asbestos work. For effective protection, respirators must fit your face and head snugly. Your employer is required to conduct fit tests when you are first assigned a respirator and every six months thereafter. Respirators should not be loosened or removed in work situations where their use is required.

(b) Protective clothing: You are required to wear protective clothing in work areas where asbestos fiber concentrations exceed the permissible exposure limits to prevent contamination of the skin. Where protective clothing is required, your employer must provide you with clean garments. Unless you are working on a large asbestos removal or demolition project, your employer must also provide a change room and separate lockers for your street clothes and contaminated work clothes. If you are working on a large asbestos removal or demolition project, and where it is feasible to do so, your employer must provide a clean room, shower, and decontamination room contiguous to the work area. When leaving the work area, you must remove contaminated clothing before proceeding to the shower. If the shower is not adjacent to the work area, you must vacuum your clothing before proceeding to the change room and shower. To prevent inhaling fibers in contaminated change rooms and showers, leave your respirator on until you leave the shower and enter the clean change room.

(4) Disposal procedures and cleanup.

(a) Wastes that are generated by processes where asbestos is present include:

- (i) Empty asbestos shipping containers.
- (ii) Process wastes such as cuttings, trimmings, or reject material.
- (iii) Housekeeping waste from sweeping or vacuuming.
- (iv) Asbestos fireproofing or insulating material that is removed from buildings.
- (v) Building products that contain asbestos removed during building renovation or demolition.
- (vi) Contaminated disposable protective clothing.

(b) Empty shipping bags can be flattened under exhaust hoods and packed into airtight containers for disposal. Empty shipping drums are difficult to clean and should be sealed.

(c) Vacuum bags or disposable paper filters should not be cleaned, but should be sprayed with a fine water mist and placed into a labeled waste container.

(d) Process waste and housekeeping waste should be wetted with water or a mixture of water and surfactant prior to packaging in disposable containers.

(e) Material containing asbestos that is removed from buildings must be disposed of in leaktight 6-mil thick plastic bags, plastic-lined cardboard containers, or plastic-lined metal containers. These wastes, which are removed while wet, should be sealed in containers before they dry out to minimize the release of asbestos fibers during handling.

(5) Access to information.

(a) Each year, your employer is required to inform you of the information contained in this standard and appendices for asbestos. In addition, your employer must instruct you in the proper work practices for handling materials containing asbestos and the correct use of protective equipment.

(b) Your employer is required to determine whether you are being exposed to asbestos. You or your representative has the right to observe employee measurements and to record the results obtained. Your employer is required to inform you of your exposure, and, if you are exposed above the permissible limits, he or she is required to inform you of the actions that are being taken to reduce your exposure to within the permissible limits.

(c) Your employer is required to keep records of your exposures and medical examinations. These exposure records must be kept for at least thirty years. Medical records must be kept for the period of your employment plus thirty years.

(d) Your employer is required to release your exposure and medical records to your physician or designated representative upon your written request.

[Statutory Authority: Chapter 49.17 RCW. 89-11-035 (Order 89-03), § 296-62-07747, filed 5/15/89, effective 6/30/89; 87-24-051 (Order 87-24), § 296-62-07747, filed 11/30/87. Statutory Authority: RCW 49.17.050(2) and 49.17.040. 87-10-008 (Order 87-06), § 296-62-07747, filed 4/27/87.]

**WAC 296-62-07749 Appendix H—Medical surveillance guidelines for asbestos—Nonmandatory.** (1) Route of entry inhalation, ingestion.

(2) Toxicology.

Clinical evidence of the adverse effects associated with exposure to asbestos is present in the form of several well-conducted epidemiological studies of occupationally exposed workers, family contacts of workers, and persons living near asbestos mines. These studies have shown a definite association between exposure to asbestos and an increased incidence of lung cancer, pleural and peritoneal mesothelioma, gastrointestinal cancer, and asbestosis. The latter is a disabling fibrotic lung disease that is caused only by exposure to asbestos. Exposure to asbestos has also been associated with an increased incidence of esophageal, kidney, laryngeal, pharyngeal, and buccal cavity cancers. As with other known chronic occupational diseases, disease associated with asbestos generally appears about twenty years following the first

occurrence of exposure: There are no known acute effects associated with exposure to asbestos.

Epidemiological studies indicate that the risk of lung cancer among exposed workers who smoke cigarettes is greatly increased over the risk of lung cancer among nonexposed smokers or exposed nonsmokers. These studies suggest that cessation of smoking will reduce the risk of lung cancer for a person exposed to asbestos but will not reduce it to the same level of risk as that existing for an exposed worker who has never smoked.

(3) Signs and symptoms of exposure-related disease.

The signs and symptoms of lung cancer or gastrointestinal cancer induced by exposure to asbestos are not unique, except that a chest x-ray of an exposed patient with lung cancer may show pleural plaques, pleural calcification, or pleural fibrosis. Symptoms characteristic of mesothelioma include shortness of breath, pain in the walls of the chest, or abdominal pain. Mesothelioma has a much longer latency period compared with lung cancer (forty years versus fifteen to twenty years), and mesothelioma is therefore more likely to be found among workers who were first exposed to asbestos at an early age. Mesothelioma is always fatal.

Asbestosis is pulmonary fibrosis caused by the accumulation of asbestos fibers in the lungs. Symptoms include shortness of breath, coughing, fatigue, and vague feelings of sickness. When the fibrosis worsens, shortness of breath occurs even at rest. The diagnosis of asbestosis is based on a history of exposure to asbestos, the presence of characteristic radiologic changes, endinspiratory crackles (rales), and other clinical features of fibrosing lung disease. Pleural plaques and thickening are observed on x-rays taken during the early stages of the disease. Asbestosis is often a progressive disease even in the absence of continued exposure, although this appears to be a highly individualized characteristic. In severe cases, death may be caused by respiratory or cardiac failure.

(4) Surveillance and preventive considerations.

As noted above, exposure to asbestos has been linked to an increased risk of lung cancer, mesothelioma, gastrointestinal cancer, and asbestosis among occupationally exposed workers. Adequate screening tests to determine an employee's potential for developing serious chronic diseases, such as cancer, from exposure to asbestos do not presently exist. However, some tests, particularly chest x-rays and pulmonary function tests, may indicate that an employee has been overexposed to asbestos increasing his or her risk of developing exposure-related chronic diseases. It is important for the physician to become familiar with the operating conditions in which occupational exposure to asbestos is likely to occur. This is particularly important in evaluating medical and work histories and in conducting physical examinations. When an active employee has been identified as having been overexposed to asbestos measures taken by the employer to eliminate or mitigate further exposure should also lower the risk of serious long-term consequences.

The employer is required to institute a medical surveillance program for all employees who are or will be exposed to asbestos at or above the action level (0.1 fiber

per cubic centimeter of air). All examinations and procedures must be performed by or under the supervision of a licensed physician, at a reasonable time and place, and at no cost to the employee.

Although broad latitude is given to the physician in prescribing specific tests to be included in the medical surveillance program, WISHA requires inclusion of the following elements in the routine examination:

(a) Medical and work histories with special emphasis directed to symptoms of the respiratory system, cardiovascular system, and digestive tract.

(b) Completion of the respiratory disease questionnaire contained in WAC 296-62-07741, Appendix D.

(c) A physical examination including a chest roentgenogram and pulmonary function test that includes measurement of the employee's forced vital capacity (FVC) and forced expiratory volume at one second (FEV<sub>1</sub>).

(d) Any laboratory or other test that the examining physician deems by sound medical practice to be necessary.

The employer is required to make the prescribed tests available at least annually to those employees covered; more often than specified if recommended by the examining physician; and upon termination of employment.

The employer is required to provide the physician with the following information: A copy of this standard and appendices; a description of the employee's duties as they relate to asbestos exposure; the employee's representative level of exposure to asbestos; a description of any personal protective and respiratory equipment used; and information from previous medical examinations of the affected employee that is not otherwise available to the physician. Making this information available to the physician will aid in the evaluation of the employee's health in relation to assigned duties and fitness to wear personal protective equipment, if required.

The employer is required to obtain a written opinion from the examining physician containing the results of the medical examination; the physician's opinion as to whether the employee has any detected medical conditions that would place the employee at an increased risk of exposure-related disease; any recommended limitations on the employee or on the use of personal protective equipment; and a statement that the employee has been informed by the physician of the results of the medical examination and of any medical conditions related to asbestos exposure that require further explanation or treatment. This written opinion must not reveal specific findings or diagnoses unrelated to exposure to asbestos and a copy of the opinion must be provided to the affected employee.

[Statutory Authority: Chapter 49.17 RCW. 87-24-051 (Order 87-24), § 296-62-07749, filed 11/30/87. Statutory Authority: RCW 49.17.050(2) and 49.17.040. 87-10-008 (Order 87-06), § 296-62-07749, filed 4/27/87.]

**WAC 296-62-07751 Appendix I—Work practices and engineering controls for major asbestos removal, renovation, and demolition operations—Nonmandatory.** This is a nonmandatory appendix designed to provide

guidelines to assist employers in complying with the requirements of WAC 296-62-077 through 296-62-07753. Specifically, this appendix describes the equipment, methods, and procedures that should be used in major asbestos removal projects conducted to abate a recognized asbestos hazard or in preparation for building renovation or demolition. These projects require the construction of negative-pressure temporary enclosures to contain the asbestos material and to prevent the exposure of bystanders and other employees at the worksite. WAC 296-62-07712 of the standard requires that "----- Whenever feasible, the employer shall establish negative-pressure enclosures before commencing asbestos removal, demolition, or renovation operations." Employers should also be aware that, when conducting asbestos removal projects, they may be required under the National Emissions Standards for Hazardous Air Pollutants (NESHAPS), 40 CFR Part 61, Subpart M, or EPA regulations under the Clean Water Act.

(1) Introduction. Construction of a negative-pressure enclosure is a simple but time-consuming process that requires careful preparation and execution; however, if the procedures below are followed, contractors should be assured of achieving a temporary barricade that will protect employees and others outside the enclosure from exposure to asbestos and minimize to the extent possible the exposure of asbestos workers inside the barrier as well.

The equipment and materials required to construct these barriers are readily available and easily installed and used. In addition to an enclosure around the removal site, the standard requires employers to provide hygiene facilities that ensure that their asbestos contaminated employees do not leave the worksite with asbestos on their persons or clothing; the construction of these facilities is also described below. The steps in the process of preparing the asbestos removal site, building the enclosure, constructing hygiene facilities, removing the asbestos-containing material, and restoring the site include:

- (a) Planning the removal project;
- (b) Procuring the necessary materials and equipment;
- (c) Preparing the work area;
- (d) Removing the asbestos-containing material;
- (e) Cleaning the work area; and
- (f) Disposing of the asbestos-containing waste.

(2) Planning the removal project. The planning of an asbestos removal project is critical to completing the project safely and cost-effectively. A written asbestos removal plan should be prepared that describes the equipment and procedures that will be used throughout the project. The asbestos abatement plan will aid not only in executing the project but also in complying with the reporting requirements of the USEPA asbestos regulations (40 CFR 61, Subpart M), which call for specific information such as a description of control methods and control equipment to be used and the disposal sites the contractor proposes to use to dispose of the asbestos-containing materials.

The asbestos abatement plan should contain the following information:

- (a) A physical description of the work area;
- (b) A description of the approximate amount of material to be removed;
- (c) A schedule for turning off and sealing existing ventilation systems;
- (d) Personnel hygiene procedures;
- (e) Labeling procedures;
- (f) A description of personal protective equipment and clothing to be worn by employees;
- (g) A description of the local exhaust ventilation systems to be used;
- (h) A description of work practices to be observed by employees;
- (i) A description of the methods to be used to remove the asbestos-containing material;
- (j) The wetting agent to be used;
- (k) A description of the sealant to be used at the end of the project;
- (l) An air monitoring plan;
- (m) A description of the method to be used to transport waste material; and
- (n) The location of the dump site.

(3) Materials and equipment necessary for asbestos removal. Although individual asbestos removal projects vary in terms of the equipment required to accomplish the removal of the material, some equipment and materials are common to most asbestos removal operations. Equipment and materials that should be available at the beginning of each project are: (a) Rolls of polyethylene sheeting; (b) rolls of gray duct tape or clear plastic tape; (c) HEPA-filtered vacuum(s); (d) HEPA-filtered portable ventilation system(s); (e) a wetting agent; (f) an airless sprayer; (g) a portable shower unit; (h) appropriate respirators; (i) disposable coveralls; (j) signs and labels; (k) preprinted disposal bags; and (l) a manometer or pressure gauge.

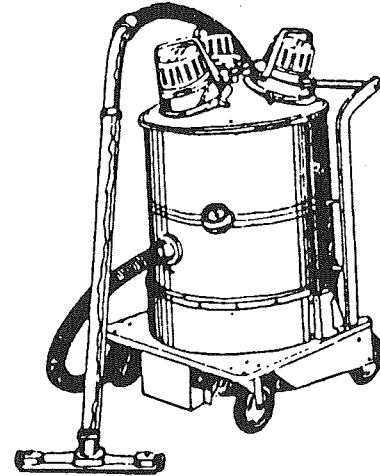
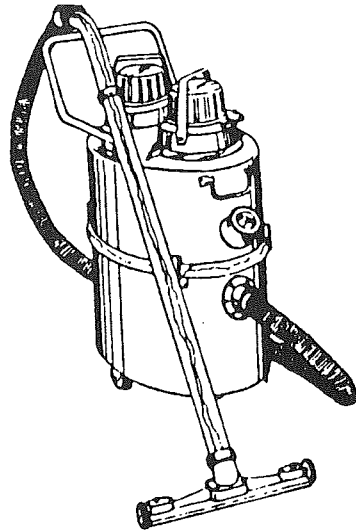
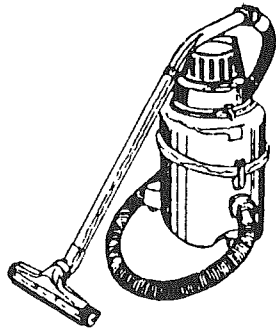
(a) and (b) Rolls of polyethylene plastic and tape. Rolls of polyethylene plastic (6 mil in thickness) should be available to construct the asbestos removal enclosure and to seal windows, doors, ventilation systems, wall penetrations, and ceilings and floors in the work area. Gray duct tape or clear plastic tape should be used to seal the edges of the plastic and to seal any holes in the plastic enclosure. Polyethylene plastic sheeting can be purchased in rolls up to twelve to twenty feet in width and up to one hundred feet in length.

(c) HEPA-filtered vacuum. A HEPA-filtered vacuum is essential for cleaning the work area after the asbestos has been removed. Such vacuums are designed to be used with a HEPA (high-efficiency particulate air) filter, which is capable of removing 99.97 percent of the asbestos particles from the air. Various sizes and capacities of HEPA vacuums are available. One manufacturer produces three models that range in capacity from five and one-quarter gallons to seventeen gallons (see Figure I-1). All of these models are portable, and all have long hoses capable of reaching out-of-the-way places, such as areas above ceiling tiles, behind pipes, etc.

(d) Exhaust air filtration system. A portable ventilation system is necessary to create a negative-pressure within the asbestos removal enclosure. Such units are

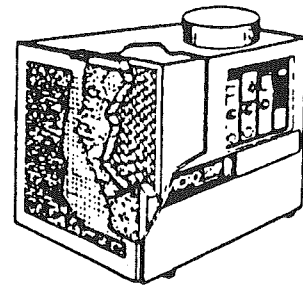
equipped with a HEPA filter and are designed to exhaust and clean the air inside the enclosure before exhausting it to the outside of the enclosure (see Figure I-2). Systems are available from several manufacturers. One supplier has two ventilation units that range in capacity from six hundred cubic feet per minute (CFM) to one thousand seven hundred CFM. According to the manufacturer's literature, these units filter particles of 0.3 micron in size with an efficiency of 99.99 percent. The number and capacity of units required to ventilate an enclosure depend on the size of the area to be ventilated.

Figure I-1. HEPA-filtered vacuums



Source: Product Catalog, Asbestos Control Technologies, Inc., Maple Shade, N.J., 1985

Figure I-2. Portable exhaust ventilation system with HEPA filter



Source: Product Catalog, Asbestos Control Technologies, Inc., Maple Shade, N.J., 1985

(e) Wetting agents. Wetting agents (surfactants) are added to water (which is then called amended water) and used to soak asbestos-containing materials; amended water penetrates more effectively than plain water and permits more thorough soaking of the asbestos-containing materials. Wetting the asbestos-containing material reduces the number of fibers that will break free and become airborne when the asbestos-containing material is handled or otherwise disturbed. Asbestos-containing materials should be thoroughly soaked before removal is attempted; the dislodged material should feel spongy to the touch. Wetting agents are generally prepared by mixing one to three ounces of wetting agent to five gallons of water.

One type of asbestos, amosite, is relatively resistant to soaking, either with plain or amended water. The work practices of choice when working with amosite-containing material are to soak the material as much as possible and then to bag it for disposal immediately after removal, so that the material has no time to dry and be ground into smaller particles that are more likely to liberate airborne asbestos.

In a very limited number of situations, it may not be possible to wet the asbestos-containing material before removing it. Examples of such rare situations are: (i) Removal of asbestos material from a "live" electrical box that was oversprayed with the material when the rest of the area was sprayed with asbestos-containing coating; and (ii) removing asbestos-containing insulation from a live steam pipe. In both of these situations, the preferred approach would be to turn off the electricity or steam, respectively, to permit wet removal methods to be used. However, where removal work must be performed during working hours, i.e., when normal operations cannot be disrupted, the asbestos-containing material must be removed dry. Immediate bagging is then the only method of minimizing the amount of airborne asbestos generated.

(f) Airless sprayer. Airless sprayers are used to apply amended water to asbestos-containing materials. Airless sprayers allow the amended water to be applied in a fine spray that minimizes the release of asbestos fibers by reducing the impact of the spray on the material to be removed. Airless sprayers are inexpensive and readily available.

(g) Portable shower. Unless the site has available a permanent shower facility that is contiguous to the removal area, a portable shower system is necessary to permit employees to clean themselves after exposure to asbestos and to remove any asbestos contamination from their hair and bodies. Taking a shower prevents employees from leaving the work area with asbestos on their clothes and thus prevents the spread of asbestos contamination to areas outside the asbestos removal area. This measure also protects members of the families of asbestos workers from possible exposure to asbestos. Showers should be supplied with warm water and a drain. A shower water filtration system to filter asbestos fibers from the shower water is recommended. Portable shower units are readily available, inexpensive, and easy to install and transport.

(h) Respirators. Employees involved in asbestos removal projects should be provided with appropriate NIOSH-approved respirators. Selection of the appropriate respirator should be based on the concentration of asbestos fibers in the work area. If the concentration of asbestos fibers is unknown, employees should be provided with respirators that will provide protection against the highest concentration of asbestos fibers that can reasonably be expected to exist in the work area. For all work within an enclosure, employees should wear supplied air respirators (see WAC 296-62-07715(3)).

(i) Disposable coveralls. Employees involved in asbestos removal operations should be provided with disposable impervious coveralls that are equipped with head and foot covers. Such coveralls are typically made of Tyvek.<sup>1</sup> The coverall has a zipper front and elastic wrists and ankles.

(j) Signs and labels. Before work begins, a supply of signs to demarcate the entrance to the work area should be obtained. Signs are available that have the wording required by the final WISHA standard. The required labels are also commercially available as press-on labels

and preprinted on the 6-mil polyethylene plastic bags used to dispose of asbestos-containing waste material.

(4) Preparing the work area. Preparation for constructing negative-pressure enclosures should begin with the removal of all movable objects from the work area, e.g., desks, chairs, rugs, and light fixtures, to ensure that these objects do not become contaminated with asbestos. When objects or surfaces are contaminated or are suspected of being contaminated, they should be vacuumed with a HEPA vacuum and cleaned with amended water, unless they are made of material that will be damaged by the wetting agent; wiping with plain water is recommended in those cases where amended water will damage the object. Before the asbestos removal work begins, objects that cannot be removed from the work area should be covered with a 6-mil-thick polyethylene plastic sheeting that is securely taped with duct tape or plastic tape to achieve an air-tight seal around the object.

(5) Constructing the enclosure. When all objects have either been removed from the work area or covered with plastic, all penetrations of the floor, walls, and ceiling should be sealed with 6-mil polyethylene plastic and tape to prevent airborne asbestos from escaping into areas outside the work area or from lodging in cracks around the penetrations. Penetrations that require sealing are typically found around electrical conduits, telephone wires, and water supply and drain pipes. A single entrance to be used for access and egress to the work area should be selected, and all other doors and windows should be sealed with tape or be covered with 6-mil polyethylene plastic sheeting and securely taped. Covering windows and unnecessary doors with a layer of polyethylene before covering the walls provides a second layer of protection and saves time in installation because it reduces the number of edges that must be cut and taped. All other surfaces such as support columns, ledges, pipes, and other surfaces should also be covered with polyethylene plastic sheeting and taped before the walls themselves are completely covered with sheeting.

Next a thin layer of spray adhesive should be sprayed along the top of all walls surrounding the enclosed work area, close to the wall-ceiling interface, and a layer of polyethylene plastic sheeting should be stuck to this adhesive and taped. The entire inside surfaces of all wall areas are covered in this manner, and the sheeting over the walls is extended across the floor area until it meets in the center of the area, where it is taped to form a single layer of material encasing the entire room except for the ceiling. A final layer of plastic sheeting is then laid across the plastic-covered floor area and up the walls to a level of two feet or so; this layer provides a second protective layer of plastic sheeting over the floor, which can then be removed and disposed of easily after the asbestos-containing material that has dropped to the floor has been bagged and removed.

(6) Building hygiene facilities. WAC 296-62-07719 mandates that employers involved in asbestos removal, demolition, or renovation operations provide their employees with hygiene facilities to be used to decontaminate asbestos-exposed workers, equipment,



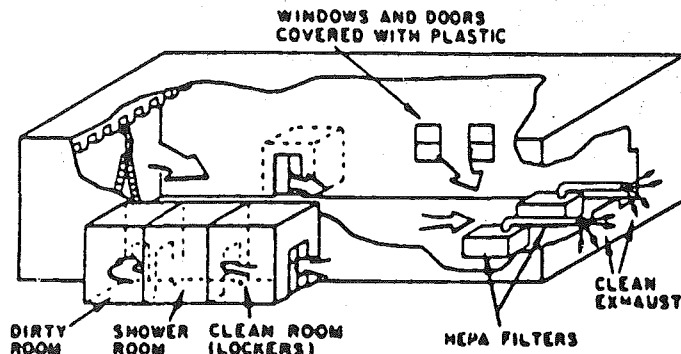
and clothing before such employees leave the work area. These decontamination facilities consist of:

- (a) A clean change room;
- (b) A shower; and
- (c) An equipment room.

The clean change room is an area in which employees remove their street clothes and don their respirators and disposable protective clothing. The clean room should have hooks on the wall or be equipped with lockers for the storage of workers' clothing and personal articles. Extra disposable coveralls and towels can also be stored in the clean change room.

The shower should be contiguous with both the clean and dirty change room (see Figure I-3) and should be used by all workers leaving the work area. The shower should also be used to clean asbestos-contaminated equipment and materials, such as the outsides of asbestos waste bags and hand tools used in the removal process.

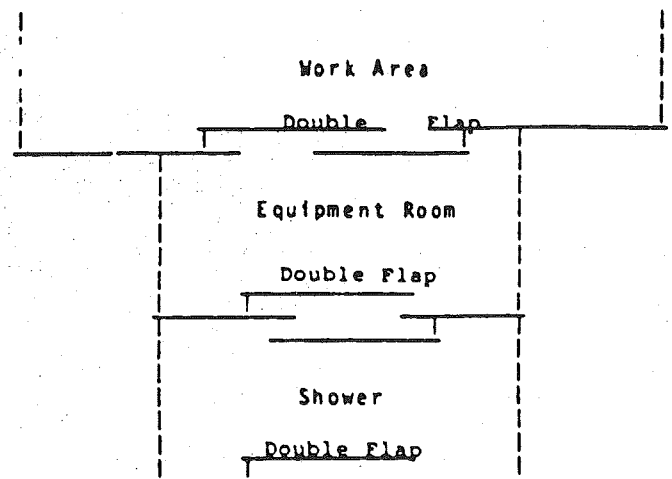
Figure I-3. Cutaway view of enclosure and hygiene facilities



Source: EPA 1985. Asbestos Waste Management Guidance (EPA/530 SW-85-007)

The equipment room (also called the dirty change room) is the area where workers remove their protective coveralls and where equipment that is to be used in the work area can be stored. The equipment room should be lined with 6-mil-thick polyethylene plastic sheeting in the same way as was done in the work area enclosure. Two layers of 6-mil polyethylene plastic sheeting that are not taped together from a double flap or barrier between the equipment room and the work area and between the shower and the clean change room (see Figure I-4).

Figure I-4. Typical hygiene facility layout



When feasible, the clean change room, shower, and equipment room should be contiguous and adjacent to the negative-pressure enclosure surrounding the removal area. In the overwhelming number of cases, hygiene facilities can be built contiguous to the negative-pressure enclosure. In some cases, however, hygiene facilities may have to be located on another floor of the building where removal of asbestos-containing materials is taking place. In these instances, the hygiene facilities can in effect be made to be contiguous to the work area by constructing a polyethylene plastic "tunnel" from the work area to the hygiene facilities. Such a tunnel can be made even in cases where the hygiene facilities are located several floors above or below the work area; the tunnel begins with a double flap door at the enclosure, extends through the exit from the floor, continues down the necessary number of flights of stairs and goes through a double flap entrance to the hygiene facilities, which have been prepared as described above. The tunnel is constructed of two-inch by four-inch lumber or aluminum struts and covered with 6-mil-thick polyethylene plastic sheeting.

In the rare instances when there is not enough space to permit any hygiene facilities to be built at the worksite, employees should be directed to change into a clean disposable worksuit immediately after exiting the enclosure (without removing their respirators) and to proceed immediately to the shower. Alternatively, employees could be directed to vacuum their disposable coveralls with a HEPA-filtered vacuum before proceeding to a shower located a distance from the enclosure.

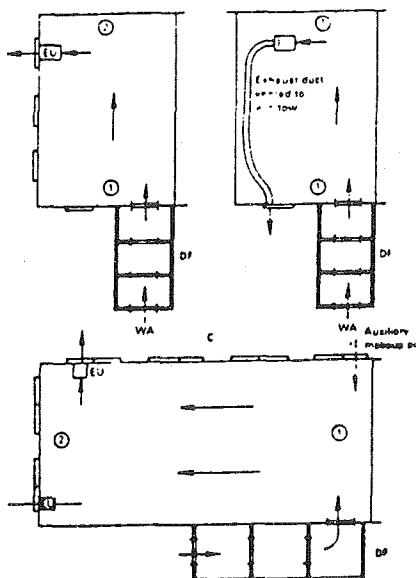
The clean room, shower, and equipment room must be sealed completely to ensure that the sole source of air flow through these areas originates from uncontaminated areas outside the asbestos removal, demolition, or renovation enclosure. The shower must be drained properly after each use to ensure that contaminated water is not released to uncontaminated areas. If waste water is inadvertently released, it should be cleaned up as soon as possible to prevent any asbestos in the water from drying and becoming airborne in areas outside the work area.



(7) Establishing negative-pressure within the enclosure. After construction of the enclosure is completed, a ventilation system(s) should be installed to create a negative-pressure within the enclosure with respect to the area outside the enclosure. Such ventilation systems must be equipped with HEPA filters to prevent the release of asbestos fibers to the environment outside the enclosure and should be operated twenty-four hours per day during the entire project until the final cleanup is completed and the results of final air samples are received from the laboratory. A sufficient amount of air should be exhausted to create a pressure of  $-0.02$  inches of water within the enclosure with respect to the area outside the enclosure.

These ventilation systems should exhaust the HEPA-filtered clean air outside the building in which the asbestos removal, demolition, or renovation is taking place (see Figure I-5). If access to the outside is not available, the ventilation system can exhaust the HEPA-filtered asbestos-free air to an area within the building that is as far away as possible from the enclosure. Care should be taken to ensure that the clean air is released either to an asbestos-free area or in such a way as not to disturb any asbestos-containing materials.

Figure I-5. Examples of negative-pressure systems. DF, decontamination facility; EU, exhaust unit; WA, worker access; A, single-room work area with multiple windows; B, single-room work area with single window near entrance; C, large single-room work area with windows and auxiliary makeup air source (dotted arrow). Arrows denote direction of air flow. Circled numbers indicate progression of removal sequence.



Source: EPA 1985. Guidance for Controlling Asbestos-Containing Materials in Buildings (EPA 560/5-85-024)

A manometer or pressure gauge for measuring the negative pressure within the enclosure should be installed and should be monitored frequently throughout

all work shifts during which asbestos removal, demolition, or renovation takes place. Several types of manometers and pressure gauges are available for this purpose.

All asbestos removal, renovation, and demolition operations should have a program for monitoring the concentration of airborne asbestos and employee exposures to asbestos. Area samples should be collected inside the enclosure (approximately four samples for five thousand square feet of enclosure area). At least two samples should be collected outside the work area, one at the entrance to the clean change room and one at the exhaust of the portable ventilation system. In addition, several breathing zone samples should be collected from those workers who can reasonably be expected to have the highest potential exposure to asbestos.

(8) Removing asbestos materials. Employers involved in asbestos removal, demolition, or renovation operations designate a competent person to:

- (a) Set up the enclosure;
- (b) Ensure the integrity of the enclosure;
- (c) Control entry to and exit from the enclosure;
- (d) Supervise all employee exposure monitoring required by this section;
- (e) Ensure the use of protective clothing and equipment;
- (f) Ensure that employees are trained in the use of engineering controls, work practices, and personal protective equipment;
- (g) Ensure the use of hygiene facilities and the observance of proper decontamination procedures; and
- (h) Ensure that engineering controls are functioning properly.

The competent person will generally be a certified industrial hygienist, an industrial hygienist with training and experience in the handling of asbestos, or a person who has such training and experience as a result of on-the-job training and experience.

Ensuring the integrity of the enclosure is accomplished by inspecting the enclosure before asbestos removal work begins and prior to each work shift throughout the entire period work is being conducted in the enclosure. The inspection should be conducted by locating all areas where air might escape from the enclosure; this is best accomplished by running a hand over all seams in the plastic enclosure to ensure that no seams are ripped and the tape is securely in place.

The competent person should also ensure that all unauthorized personnel do not enter the enclosure and that all employees and other personnel who enter the enclosure have the proper protective clothing and equipment. He or she should also ensure that all employees and other personnel who enter the enclosure use the hygiene facilities and observe the proper decontamination procedures (described below).

Proper work practices are necessary during asbestos removal, demolition, and renovation to ensure that the concentration of asbestos fibers inside the enclosure remains as low as possible. One of the most important work practices is to wet the asbestos-containing material

before it is disturbed. After the asbestos-containing material is thoroughly wetted, it should be removed by scraping (as in the case of sprayed-on or troweled-on ceiling material) or removed by cutting the metal bands or wire mesh that support the asbestos-containing material on boilers or pipes. Any residue that remains on the surface of the object from which asbestos is being removed should be wire brushed and wet wiped.

Bagging asbestos waste material promptly after its removal is another work practice control that is effective in reducing the airborne concentration of asbestos within the enclosure. Whenever possible, the asbestos should be removed and placed directly into bags for disposal rather than dropping the material to the floor and picking up all of the material when the removal is complete. If a significant amount of time elapses between the time that the material is removed and the time it is bagged, the asbestos material is likely to dry out and generate asbestos-laden dust when it is disturbed by people working within the enclosure. Any asbestos-contaminated supplies and equipment that cannot be decontaminated should be disposed of in pre-labeled bags; items in this category include plastic sheeting, disposable work clothing, respirator cartridges, and contaminated wash water.

A checklist is one of the most effective methods of ensuring adequate surveillance of the integrity of the asbestos removal enclosure. Such a checklist is shown in Figure I-6. Filling out the checklist at the beginning of each shift in which asbestos removal is being performed will serve to document that all the necessary precautions will be taken during the asbestos removal work. The checklist contains entries for ensuring that:

- The work area enclosure is complete;
- The negative-pressure system is in operation;
- Necessary signs and labels are used;

Asbestos Removal, Renovation, and Demolition Checklist

Date \_\_\_\_\_ Location \_\_\_\_\_  
 Supervisor \_\_\_\_\_ Project # \_\_\_\_\_  
 Work Area (sq. ft.) \_\_\_\_\_

	Yes	No
I. Work site barrier		
Floor covered	___	___
Walls covered	___	___
Area ventilation off	___	___
All edges sealed	___	___
Penetrations sealed	___	___
Entry curtains	___	___
II. Negative air pressure		
HEPA Vac _____ Ventilation system _____		
Constant operation	___	___
Negative pressure achieved	___	___
III. Signs		
Work area entrance	___	___
Bags labeled	___	___
IV. Work practices		
Removed material promptly bagged	___	___
Material worked wet	___	___
HEPA vacuum used	___	___
No smoking	___	___

	Yes	No
No eating, drinking	___	___
Work area cleaned after completion	___	___
Personnel decontaminated each departure	___	___
V. Protective equipment		
Disposable clothing used one time	___	___
Proper NIOSH-approved respirators	___	___
VII. Showers		
On site	___	___
Functioning	___	___
Soap and towels	___	___
Used by all personnel	___	___

Figure I-6. Checklist

Appropriate work practices are used;  
 Necessary protective clothing and equipment are used;  
 and  
 Appropriate decontamination procedures are being followed.

(9) Cleaning the work area. After all of the asbestos-containing material is removed and bagged, the entire work area should be cleaned until it is free of all visible asbestos dust. All surfaces from which asbestos has been removed should be cleaned by wire brushing the surfaces, HEPA vacuuming these surfaces, and wiping them with amended water. The inside of the plastic enclosure should be vacuumed with a HEPA vacuum and wet wiped until there is no visible dust in the enclosure. Particular attention should be given to small horizontal surfaces such as pipes, electrical conduits, lights, and support tracks for drop ceilings. All such surfaces should be free of visible dust before the final air samples are collected.

Additional sampling should be conducted inside the enclosure after the cleanup of the work area has been completed. Approximately four area samples should be collected for each five thousand square feet of enclosure area. The enclosure should not be dismantled unless the final samples show asbestos concentrations of less than the action level.

A clearance checklist is an effective method of ensuring that all surfaces are adequately cleaned and the enclosure is ready to be dismantled. Figure I-7 shows a checklist that can be used during the final inspection phase of asbestos abatement, removal, or renovation operations.

Final Inspection of Asbestos Removal, Renovation, and Demolition Projects

Date: \_\_\_\_\_  
 Project: \_\_\_\_\_  
 Location: \_\_\_\_\_  
 Building: \_\_\_\_\_

CHECKLIST:

Residual dust on:	Yes	No	Yes	No
a. Floor	___	___	e. Horizontal surfaces	___
b. Horizontal surfaces	___	___	f. Pipes	___
c. Pipes	___	___	g. Ducts	___
d. Ventilation equipment	___	___	h. Register	___
			i. Lights	___

## FIELD NOTES:

Record any problems encountered here.

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## FINAL AIR SAMPLE RESULTS:

Figure I-7. Clearance Checklist

<sup>1</sup> Mention of trade names or commercial products does not constitute endorsement or recommendation for use.

[Statutory Authority: Chapter 49.17 RCW. 87-24-051 (Order 87-24), § 296-62-07751, filed 11/30/87.]

**WAC 296-62-07753 Appendix J--Work practices and engineering controls for small-scale, short-duration asbestos renovation and maintenance activities--Non-mandatory.** This appendix is not mandatory, in that employers may choose to comply with all of the requirements of WISHA's standard for occupational exposure to asbestos during construction activities, WAC 296-62-077 through 296-62-07753. However, employers wishing to be exempted from the requirements of WAC 296-62-07712 shall comply with the provisions of this appendix when performing small-scale, short-duration renovation or maintenance operations. WISHA anticipates that employers in the electrical, carpentry, utility, plumbing, and interior construction trades may wish to avail themselves of the final standard's exemptions for small-scale, short-duration renovation and maintenance activities.

(1) Definition of small-scale, short-duration activities. For the purposes of this appendix, small-scale, short-duration renovation and maintenance activities are tasks such as, but not limited to:

Removal of asbestos-containing insulation on pipes;

Removal of small quantities of asbestos-containing insulation on beams or above ceilings;

Replacement of an asbestos-containing gasket on a valve;

Installation or removal of a small section of drywall;

Installation of electrical conduits through or proximate to asbestos-containing materials.

Evidence in the record suggests that the use of certain engineering and work practice controls is capable of reducing employee exposures to asbestos to levels below the action level (0.1 f/cc). Several controls and work practices, used either singly or in combination, can be employed effectively to reduce asbestos exposures during small maintenance and renovation operations. These include:

Wet methods;

Removal methods;

Use of glove bags;

Removal of entire asbestos insulated pipes or structures;

Use of mini-enclosures;

Enclosure of asbestos materials; and

Maintenance programs.

This appendix describes these controls and work practices in detail.

(2) Preparation of the area before renovation or maintenance activities. The first step in preparing to perform a small-scale, short-duration asbestos renovation or maintenance task, regardless of the abatement method that will be used, is the removal from the work area of all objects that are movable to protect them from asbestos contamination. Objects that cannot be removed must be covered completely with a 6-mil-thick polyethylene plastic sheeting before the task begins. If objects have already been contaminated, they should be thoroughly cleaned with a high-efficiency particulate air (HEPA) filtered vacuum or be wet wiped before they are removed from the work area or completely encased in the plastic.

(3) Wet methods. Whenever feasible, and regardless of the abatement method to be used (e.g., removal, enclosure, use of glove bags), wet methods must be used during small-scale, short-duration maintenance and renovation activities that involve disturbing asbestos-containing materials. Handling asbestos materials wet is one of the most reliable methods of ensuring that asbestos fibers do not become airborne, and this practice should therefore be used whenever feasible. Wet methods can be used in the great majority of workplace situations. Only in cases where asbestos work must be performed on live electrical equipment, on live steam lines, or in other areas where water will seriously damage materials or equipment may dry removal be performed. Amended water or another wetting agent should be applied by means of an airless sprayer to minimize the extent to which the asbestos-containing material is disturbed.

Asbestos-containing materials should be wetted from the initiation of the maintenance or renovation operation and wetting agents should be used continually throughout the work period to ensure that any dry asbestos-containing material exposed in the course of the work is wet and remains wet until final disposal.

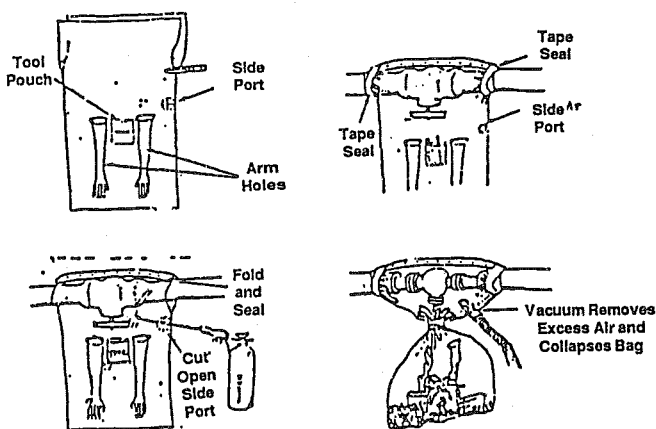
(4) Removal of small amount of asbestos-containing materials. Several methods can be used to remove small amounts of asbestos-containing materials during small-scale, short-duration renovation or maintenance tasks. These include the use of glove bags, the removal of an entire asbestos-covered pipe or structure, and the construction of mini-enclosures. The procedures that employers must use for each of these operations if they wish to avail themselves of the final rule's exemptions are described in the following subsections.

(5) Glove bags. The use of glove bags to enclose the work area during small-scale, short-duration maintenance or renovation activities will result in employee exposures to asbestos that are below the action level of 0.1 f/cc. This appendix provides requirements for glove bag procedures to be followed by employers wishing to avail themselves of the standard's exemptions for each activity. WISHA has determined that the use of these procedures will reduce the eight-hour time-weighted average (TWA) exposures of employees involved in these work operations to levels below the action level and

will thus provide a degree of employee protection equivalent to that provided by compliance with all provisions of the final rule.

(a) **Glove bag installation.** Glove bags are approximately forty-inch-wide times sixty-four-inch-long bags fitted with arms through which the work can be performed (see Figure J-1(A)). When properly installed and used, they permit workers to remain completely isolated from the asbestos material removed or replaced inside the bag. Glove bags can thus provide a flexible, easily installed, and quickly dismantled temporary small work area enclosure that is ideal for small-scale asbestos renovation or maintenance jobs.

Figure J-1. Diagrams showing proper use of glove bags in small-scale, short-duration maintenance and renovation operations



These bags are single use control devices that are disposed of at the end of each job. The bags are made of transparent 6-mil-thick polyethylene plastic with arms made of material such as Tyvek\* (the same material used to make the disposable protective suits used in major asbestos removal, renovation, and demolition operations and in protective gloves). Glove bags are readily available from safety supply stores or specialty asbestos removal supply houses. Glove bags come pre-labeled with the asbestos warning label prescribed by WISHA and EPA for bags used to dispose of asbestos waste.

(b) **Glove bag equipment and supplies.** Supplies and materials that are necessary to use glove bags effectively include:

- (i) Tape to seal the glove bag to the area from which asbestos is to be removed;
- (ii) Amended water or other wetting agents;
- (iii) An airless sprayer for the application of the wetting agent;
- (iv) Bridging encapsulant (a paste-like substance for coating asbestos) to seal the rough edges of any asbestos-containing materials that remain within the glove bag at the points of attachment after the rest of the asbestos has been removed;
- (v) Tools such as razor knives, nips, and wire brushes (or other tools suitable for cutting wire, etc.);

(vi) A HEPA filter-equipped vacuum for evacuating the glove bag (to minimize the release of asbestos fibers) during removal of the bag from the work area and for cleaning any material that may have escaped during the installation of the glove bag; and

(vii) HEPA-equipped cartridge respirators for use by the employees involved in the removal of asbestos with the glove bag.

(c) **Glove bag work practices.** The proper use of glove bags requires the following steps:

(i) Glove bags must be installed so that they completely cover the pipe or other structure where asbestos work is to be done. Glove bags are installed by cutting the sides of the glove bag to fit the size of the pipe from which asbestos is to be removed. The glove bag is attached to the pipe by folding the open edges together and securely sealing them with tape. All openings in the glove bag must be sealed with duct tape or equivalent material. The bottom seam of the glove bag must also be sealed with duct tape or equivalent to prevent any leakage from the bag that may result from a defect in the bottom seam (Figure J-1(B)).

(ii) The employee who is performing the asbestos removal with the glove bag must don a half-mask dual-cartridge HEPA-equipped respirator; respirators and protective clothing should be worn by employees who are in close contact with the glove bag and who may thus be exposed as a result of small gaps in the seams of the bag or holes punched through the bag by a razor knife or a piece of wire mesh.

(iii) The removed asbestos material from the pipe or other surface that has fallen into the enclosed bag must be thoroughly wetted with a wetting agent (applied with an airless sprayer through the pre-cut port provided in most glove bags or applied through a small hole cut in the bag) (Figure J-1(C)).

(iv) Once the asbestos material has been thoroughly wetted, it can be removed from the pipe, beam or other surface. The choice of tool to use to remove the asbestos-containing material depends on the type of material to be removed. Asbestos-containing materials are generally covered with painted canvas and/or wire mesh. Painted canvas can be cut with a razor knife and peeled away from the asbestos-containing material underneath. Once the canvas has been peeled away, the asbestos-containing material underneath may be dry, in which case it should be resprayed with a wetting agent to ensure that it generates as little dust as possible when removed. If the asbestos-containing material is covered with wire mesh, the mesh should be cut with nips, tin snips, or other appropriate tool and removed.

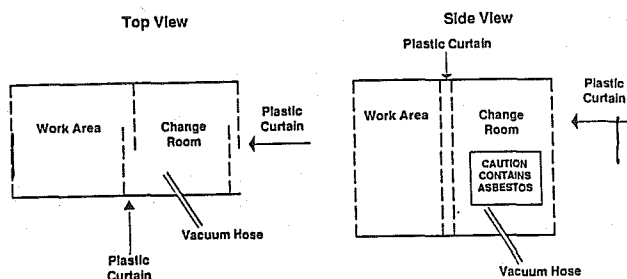
A wetting agent must then be used to spray any layer of dry material that is exposed beneath the mesh, the surface of the stripped underlying structure, and the inside of the glove bag.

(v) After removal of the layer of asbestos-containing material, the pipe or surface from which asbestos has been removed must be thoroughly cleaned with a wire brush and wet wiped with a wetting agent until no traces of the asbestos-containing material can be seen.

(vi) Any asbestos-containing insulation edges that have been exposed as a result of the removal or maintenance activity must be encapsulated with bridging encapsulant to ensure that the edges do not release asbestos fibers to the atmosphere after the glove bag has been removed.

(vii) When the asbestos removal and encapsulation have been completed, a vacuum hose from a HEPA-filtered vacuum must be inserted into the glove bag through the port to remove any air in the bag that may contain asbestos fibers. When the air has been removed from the bag, the bag should be squeezed tightly (as close to the top as possible), twisted, and sealed with tape, to keep the asbestos materials safely in the bottom of the bag. The HEPA vacuum can then be removed from the bag and the glove bag itself can be removed from the work area to be disposed of properly (Figure J-1(D)).

Figure J-2. Schematic of mini-enclosure



(6) Mini-enclosures. In some instances, such as removal of asbestos from a small ventilation system or from a short length of duct, a glove bag may not be either large enough or of the proper shape to enclose the work area. In such cases, a mini-enclosure can be built around the area where small-scale, short-duration asbestos maintenance or renovation work is to be performed (Figure J-2). Such an enclosure should be constructed of 6-mil-thick polyethylene plastic sheeting and can be small enough to restrict entry to the asbestos work area to one worker.

For example, a mini-enclosure can be built in a small utility closet when asbestos-containing duct covering is to be removed. The enclosure is constructed by:

(a) Affixing plastic sheeting to the walls with spray adhesive and tape;

(b) Covering the floor with plastic and sealing the plastic covering the floor to the plastic on the walls;

(c) Sealing any penetrations such as pipes or electrical conduits with tape; and

(d) Constructing a small change room (approximately three feet square) made of 6-mil-thick polyethylene plastic supported by two-inch by four-inch lumber (the plastic should be attached to the lumber supports with staples or spray adhesive and tape).

The change room should be contiguous to the mini-enclosure, and is necessary to allow the worker to vacuum off his protective coveralls and remove them before leaving the work area. While inside the enclosure, the

worker should wear Tyvek<sup>1</sup> disposable coveralls and use the appropriate HEPA-filtered dual cartridge respiratory protection.

The advantages of mini-enclosures are that they limit the spread of asbestos contamination, reduce the potential exposure of bystanders and other workers who may be working in adjacent areas, and are quick and easy to install. The disadvantage of mini-enclosures is that they may be too small to contain the equipment necessary to create a negative-pressure within the enclosure; however, the double layer of plastic sheeting will serve to restrict the release of asbestos fibers to the area outside the enclosure.

(7) Removal of entire structures. When pipes are insulated with asbestos-containing materials, removal of the entire pipe may be more protective, easier, and more cost-effective than stripping the asbestos insulation from the pipe. Before such a pipe is cut, the asbestos-containing insulation must be wrapped with 6-mil polyethylene plastic and securely sealed with duct tape or equivalent. This plastic covering will prevent asbestos fibers from becoming airborne as a result of the vibration created by the power saws used to cut the pipe. If possible, the pipes should be cut at locations that are not insulated to avoid disturbing the asbestos. If a pipe is completely insulated with asbestos-containing materials, small sections should be stripped using the glove-bag method described above before the pipe is cut at the stripped sections.

(8) Enclosure. The decision to enclose rather than remove asbestos-containing material from an area depends on the building owner's preference, i.e., for removal or containment. Owners consider such factors as cost effectiveness, the physical configuration of the work area, and the amount of traffic in the area when determining which abatement method to use.

If the owner chooses to enclose the structure rather than to remove the asbestos-containing material insulating it, a solid structure (airtight walls and ceilings) must be built around the asbestos covered pipe or structure to prevent the release of asbestos-containing materials into the area beyond the enclosure and to prevent disturbing these materials by casual contact during future maintenance operations.

Such a permanent (i.e., for the life of the building) enclosure should be built of new construction materials and should be impact resistant and airtight. Enclosure walls should be made of tongue-and-groove boards, boards with spine joints, or gypsum boards having taped seams. The underlying structure must be able to support the weight of the enclosure. (Suspended ceilings with laid in panels do not provide airtight enclosures and should not be used to enclose structures covered with asbestos-containing materials.) All joints between the walls and ceiling of the enclosure should be caulked to prevent the escape of asbestos fibers. During the installation of enclosures, tools that are used (such as drills or rivet tools) should be equipped with HEPA-filtered vacuums. Before constructing the enclosure, all electrical conduits, telephone lines, recessed lights, and pipes in the area to be enclosed should be moved to ensure that

the enclosure will not have to be reopened later for routine or emergency maintenance. If such lights or other equipment cannot be moved to a new location for logistic reasons, or if moving them will disturb the asbestos-containing materials, removal rather than enclosure of the asbestos-containing materials is the appropriate control method to use.

(9) Maintenance program. An asbestos maintenance program must be initiated in all facilities that have asbestos-containing materials. Such a program should include:

Development of an inventory of all asbestos-containing materials in the facility;

Periodic examination of all asbestos-containing materials to detect deterioration;

Written procedures for handling asbestos materials during the performance of small-scale, short-duration maintenance and renovation activities;

Written procedures for asbestos disposal; and

Written procedures for dealing with asbestos-related emergencies.

Members of the building's maintenance engineering staff (electricians, heating/air conditioning engineers, plumbers, etc.) who may be required to handle asbestos-containing materials should be trained in safe procedures. Such training should include at a minimum:

Information regarding types of asbestos and its various uses and forms;

Information on the health effects associated with asbestos exposure;

Descriptions of the proper methods of handling asbestos-containing materials; and

Information on the use of HEPA-equipped dual cartridge respiratory and other personal protection during maintenance activities.

(10) Prohibited activities. The training program for the maintenance engineering staff should describe methods of handling asbestos-containing materials as well as routine maintenance activities that are prohibited when asbestos-containing materials are involved. For example, maintenance staff employees should be instructed:

Not to drill holes in asbestos-containing materials;

Not to hang plants or pictures on structures covered with asbestos-containing materials;

Not to sand asbestos-containing floor tile;

Not to damage asbestos-containing materials while moving furniture or other objects;

Not to install curtains, drapes, or dividers in such a way that they damage asbestos-containing materials;

Not to dust floors, ceilings, moldings or other surfaces in asbestos-contaminated environments with a dry brush or sweep with a dry broom;

Not to use an ordinary vacuum to clean up asbestos-containing debris;

Not to remove ceiling tiles below asbestos-containing materials without wearing the proper respiratory protection, clearing the area of other people, and observing asbestos removal waste disposal procedures;

Not to remove ventilation system filters dry; and

Not to shake ventilation system filters.

\* Mention of trade names or commercial products does not constitute endorsement or recommendation for use.

† Mention of trade names or commercial products does not constitute endorsement or recommendation for use.

[Statutory Authority: Chapter 49.17 RCW. 89-21-018 (Order 89-10), § 296-62-07753, filed 10/10/89, effective 11/24/89; 87-24-051 (Order 87-24), § 296-62-07753, filed 11/30/87.]

**WAC 296-62-07761 Nonasbestiform tremolite, anthophyllite, and actinolite.** (1) Definitions. For the purpose of this section:

(a) "Department" means the department of labor and industries.

(b) "Director" means the director of the department of labor and industries or his/her authorized representatives.

(c) "Employee exposure" means that exposure to airborne tremolite, anthophyllite, actinolite, or a combination of these minerals that would occur if the employee were not using respiratory protective equipment.

(d) "Fiber" means a particulate form of tremolite, anthophyllite, or actinolite, five micrometers or longer, with a length-to-diameter ratio of at least three to one.

(e) "Tremolite, anthophyllite, or actinolite" means the nonasbestos form of these minerals, and any of these minerals that have been chemically treated and/or altered.

(2) Permissible exposure to airborne concentrations of tremolite, anthophyllite, and actinolite fibers including any combination of these minerals.

(a) The eight-hour time-weighted average airborne concentration of tremolite, anthophyllite, and actinolite fibers to which any employee may be exposed shall not exceed two fibers per cubic centimeter of air, as determined by the method prescribed in subsection (5) of this section.

(b) Ceiling concentration. No employee shall be exposed at any time to an airborne concentration of tremolite, anthophyllite, and actinolite fibers in excess of ten fibers per cubic centimeter of air, as determined by the method prescribed in subsection (5) of this section.

(3) Methods of compliance.

(a) Engineering methods.

(i) Engineering controls. Engineering controls, such as, but not limited to, isolation, enclosure, exhaust ventilation, and dust collection, shall be used to meet the exposure limits prescribed in subsection (2) of this section.

(ii) Local exhaust ventilation. Local exhaust ventilation and dust collection systems shall be designed, constructed, installed, and maintained in accordance with the American National Standard Fundamentals Governing the Design and Operation of Local Exhaust Systems, ANSI Z9.2-1971, which is incorporated by reference herein.

(iii) Particular tools. All hand-operated and power-operated tools which may produce or release tremolite, anthophyllite, and actinolite fibers in excess of the exposure limits prescribed in subsection (2) of this section, such as, but not limited to, saws, scorers, abrasive wheels, and drills, shall be provided with local exhaust ventilation systems in accordance with (a)(ii) of this subsection.



## (b) Work practices.

(i) Wet methods. Insofar as practicable, tremolite, anthophyllite, and actinolite shall be handled, mixed, applied, removed, cut, scored, or otherwise worked in a wet state sufficient to prevent the emission of airborne fibers in excess of the exposure limits prescribed in subsection (2) of this section, unless the usefulness of the product would be diminished thereby.

(ii) Particular products and operations. No tremolite, anthophyllite, and actinolite cement, mortar, coating, grout, plaster, or similar material containing tremolite, anthophyllite, and actinolite shall be removed from bags, cartons, or other containers in which they are shipped, without being either wetted, or enclosed, or ventilated so as to prevent effectively the release of airborne tremolite, anthophyllite, and actinolite fibers in excess of the limits prescribed in subsection (2) of this section.

(iii) Spraying, demolition, or removal. Employees engaged in the spraying of tremolite, anthophyllite, and actinolite, the removal, or demolition of pipes, structures, or equipment covered or insulated with tremolite, anthophyllite, and actinolite, and in the removal or demolition of tremolite, anthophyllite, and actinolite insulation or coverings shall be provided with Type "C" supplied air respiratory equipment and with special clothing in accordance with subsection (4)(c) of this section.

## (4) Personal protective equipment.

(a) Compliance with the exposure limits prescribed by subsection (2) of this section may not be achieved by the use of respirators or shift rotation of employees except:

(i) During the time period necessary to install the engineering controls and to institute the work practices required by subsection (3) of this section.

(ii) In work situations in which the methods prescribed in subsection (3) of this section are either technically not feasible or feasible to an extent insufficient to reduce the airborne concentration of tremolite, anthophyllite, and actinolite fibers below the limits prescribed by subsection (2) of this section; or

## (iii) In emergencies.

(iv) Where both respirators and personnel rotation are allowed by (a)(i), (ii), or (iii) of this subsection, and both are practicable, personnel rotation shall be preferred and used.

(b) Where a respirator is permitted by (a)(i), (ii), or (iii) of this subsection, it shall comply with the applicable provisions of WAC 296-62-071.

(i) Respirator selection. The employer shall select, provide, and ensure the use of respirators, at no cost to the employees, in accordance with the respirator protection factors listed in Table 1 of this section.

## (ii) Establishment of a respirator program.

(A) The employer shall establish a respirator program in accordance with the requirements of chapter 296-62 WAC.

(B) No employee shall be assigned to tasks requiring the use of respirators if, based upon his most recent examination, an examining physician determines that the employee will be unable to function normally wearing a respirator, or that the safety or health of the employee

or other employees will be impaired by his/her use of a respirator. Such employee shall be rotated to another job or given the opportunity to transfer to a different position whose duties he/she is able to perform with the same employer, in the same geographical area and with the same seniority, status, and rate of pay he/she had just prior to such transfer, if such a different position is available.

(c) Special clothing: The employer shall provide at no cost, and require the use of, special clothing, such as coveralls or similar whole body clothing, head coverings, gloves, and foot coverings for any employee exposed to an airborne concentration of tremolite, anthophyllite, and actinolite fibers, which exceeds 2 f/cc.

## (d) Change rooms:

(i) At any place of employment exposed to an airborne concentration of tremolite, anthophyllite, and actinolite fibers in excess of the exposure limits prescribed in subsection (2) of this section, the employer shall provide change rooms for employees.

(ii) Clothes lockers: The employer shall provide two separate lockers or containers for each employee, so separated or isolated as to prevent contamination of the employee's street clothes from his/her work clothes.

## (iii) Laundering:

(A) Laundering of tremolite, anthophyllite, and actinolite contaminated clothing shall be done so as to prevent the release of airborne fibers in excess of the exposure limits prescribed in subsection (2) of this section.

(B) Any employer who gives contaminated clothing to another person for laundering shall inform such person of the requirement in (d) of this subsection to effectively prevent the release of airborne tremolite, anthophyllite, and actinolite fibers in excess of the exposure limits prescribed in subsection (2) of this section.

(C) Contaminated clothing shall be transported in sealed impermeable bags, or other closed, impermeable containers, and labeled in accordance with subsection (7)(b) of this section.

(5) Method of measurement. All determinations of airborne concentrations of tremolite, anthophyllite, and actinolite fibers shall be made by the membrane filter method at 400-450 X (magnification) four millimeter objective with phase contrast illumination.

## (6) Monitoring.

(a) Initial determinations. Every employer shall cause every place of employment where tremolite, anthophyllite, and actinolite fibers are released to be monitored in such a way as to determine whether every employee's exposure to tremolite, anthophyllite, and actinolite fibers is below the limits prescribed in subsection (2) of this section. If the limits are exceeded, the employer shall immediately undertake a compliance program in accordance with subsection (3) of this section.

## (b) Personal monitoring.

(i) Samples shall be collected from within the breathing zone of the employees, on membrane filters of 0.8 micrometer porosity mounted in an open-face filter holder. Samples shall be taken for the determination of



the eight-hour time-weighted average airborne concentration and of the ceiling concentration of tremolite, anthophyllite, and actinolite fibers.

(ii) Sampling frequency and patterns. After the initial determinations required by (a) of this subsection, samples shall be of such frequency and pattern as to represent with reasonable accuracy the levels of exposure of employees. In no case shall the sampling be done at intervals greater than six months for employees whose exposure to tremolite, anthophyllite, and actinolite may reasonably be foreseen to exceed the limits prescribed by subsection (2) of this section.

(c) Environmental monitoring.

(i) Samples shall be collected from areas of a work environment which are representative of the airborne concentration of tremolite, anthophyllite, and actinolite fibers which may reach the breathing zone of employees. Samples shall be collected on a membrane filter of 0.8 micrometer porosity mounted in an open-face filter holder. Samples shall be taken for the determination of the eight-hour time-weighted average airborne concentration and of the ceiling concentration of tremolite, anthophyllite, and actinolite fibers.

(ii) Sampling frequency and patterns. After the initial determinations required by (a) of this subsection, samples shall be of such frequency and pattern as to represent with reasonable accuracy the levels of exposure of the employees. In no case shall sampling be at intervals greater than six months for employees whose exposures to tremolite, anthophyllite, and actinolite may reasonably be foreseen to exceed the exposure limits prescribed in subsection (2) of this section.

(d) Employee observation of monitoring. Affected employees, or their representatives, shall be given a reasonable opportunity to observe any monitoring required by this subsection and shall have access to the records thereof.

(7) Caution signs and labels.

(a) Caution signs.

(i) Posting. Caution signs shall be provided and displayed at each location where airborne concentrations of tremolite, anthophyllite, and actinolite fibers are reasonably expected to be released or where airborne concentrations of tremolite, anthophyllite, and actinolite fibers may be in excess of the exposure limits prescribed in subsection (2) of this section. Signs shall be posted at such a distance from such a location so that an employee may read the signs and take necessary protective steps before entering the area marked by the signs. Signs shall be posted at all approaches to areas containing airborne tremolite, anthophyllite, and actinolite fibers.

(ii) Sign specifications. The warning signs required by (a)(i) of this subsection shall conform to the requirements of 20" X 14" vertical format signs specified in WAC 296-24-14007(4) and to this subsection. The signs shall display the following legend in the lower panel, with letter sizes and styles of a visibility at least equal to that specified in this subdivision.

Legend	Notation
Tremolite, anthophyllite, and actinolite _____	1" Sans Serif, Gothic or Block.
Dust hazard _____	3/4" Sans Serif, Gothic or Block.
Avoid breathing dust _____	1/4" Gothic.
Wear assigned protective equipment _____	1/4" Gothic.
Do not remain in area unless your work requires it _____	1/4" Gothic.
Breathing tremolite, anthophyllite, and actinolite fibers may be hazardous to your health _____	14 point Gothic.

Spacing between lines shall be at least equal to the height of the upper of any two lines.

(b) Caution labels.

(i) Labeling. Caution labels shall be affixed to all raw materials, mixtures, scrap, waste, debris, and other products containing tremolite, anthophyllite, and actinolite fibers, or to their containers, except that no label is required where fibers have been modified by a bonding agent, coating, binder, or other material so that during any reasonably foreseeable use, handling, storage, disposal, processing, or transportation, no airborne fibers will be released.

(ii) Label specifications. The caution labels required by (b)(i) of this subsection shall be printed in letters of sufficient size and contrast as to be readily visible and legible. The label shall state:

**CAUTION**

Contains Tremolite, Anthophyllite, or Actinolite Fibers

Avoid Creating Dust

Breathing Tremolite, Anthophyllite, or Actinolite Fibers  
May Cause

Serious Bodily Harm

(8) Housekeeping.

(a) Cleaning. All external surfaces in any place of employment shall be maintained free of accumulations of tremolite, anthophyllite, and actinolite fibers.

(b) Waste disposal. Tremolite, anthophyllite, and actinolite waste, scrap, debris, bags, containers, equipment, and contaminated clothing, consigned for disposal, shall be collected and disposed of in sealed impermeable bags at least 6 mils in thickness, or other closed, impermeable containers.

(c) Deterioration. Friable tremolite, anthophyllite, or actinolite and friable tremolite, anthophyllite, or actinolite containing material which has become damaged or deteriorated shall be repaired, enclosed, encapsulated, or removed.

(9) Recordkeeping.

(a) Exposure records. Every employer shall maintain records of any personal or environmental monitoring required by subsection (6) of this section. Records shall be maintained for a period of at least thirty years and shall be made available upon request to the director of the department of labor and industries.

(b) Access. Employee exposure records required by this subsection shall be provided upon request to employees, designated representatives, and the assistant director in accordance with WAC 296-62-05201 through 296-62-05209 and WAC 296-62-05213 through 296-62-05217.

(c) Employee notification. Any employee found to have been exposed at any time to an airborne concentration of tremolite, anthophyllite, or actinolite fibers in excess of the limits prescribed in subsection (2) of this section shall be notified in writing of the exposure as soon as practicable but not later than five days of the finding. The employee shall also be timely notified of the corrective action being taken.

(10) Medical examinations.

(a) General. The employer shall provide or make available at his/her cost, medical examinations relative to exposure to tremolite, anthophyllite, or actinolite required by this section.

(b) Preplacement. The employer shall provide or make available to each of his/her employees, within thirty calendar days following his/her first employment in an occupation exposed to an airborne concentration of tremolite, anthophyllite, or actinolite fibers, a comprehensive medical examination, which shall include, as a minimum, a chest roentgenogram (posterior-anterior fourteen by seventeen inches), a history to elicit symptomatology of respiratory disease, and pulmonary function tests to include forced vital capacity (FVC) and forced expiratory volume at one second (FEV<sub>1.0</sub>).

(c) Annual examinations. Every employer shall provide or make available on an annual basis, comprehensive medical examinations to each of his/her employees engaged in occupations exposed to airborne concentrations of tremolite, anthophyllite, and actinolite fibers. Such annual examination shall include, as a minimum, a chest roentgenogram (posterior-anterior fourteen by seventeen inches), a history to elicit symptomatology of respiratory disease, and pulmonary function tests to include forced vital capacity (FVC) and forced expiratory volume at one second (FEV<sub>1.0</sub>).

(d) Termination of employment. The employer shall provide, or make available, within thirty calendar days before or after the termination of employment of any employee engaged in an occupation exposed to an airborne concentration of tremolite, anthophyllite, or actinolite fibers, a comprehensive medical examination which shall include, as a minimum, a chest roentgenogram (posterior-anterior fourteen by seventeen inches), a history to elicit symptomatology of respiratory disease, and pulmonary function tests to include forced vital capacity (FVC) and forced expiratory volume at one second (FEV<sub>1.0</sub>).

(e) Recent examinations. No medical examination is required of any employee, if adequate records show that the employee has been examined in accordance with this subsection within the past one-year period.

(f) Medical records.

(i) Maintenance. Employers of employees examined pursuant to this subsection shall cause to be maintained

complete and accurate records of all such medical examinations. Records shall be retained by employers for at least thirty years.

(ii) Access. Records of the medical examinations required by this subsection shall be provided upon request to employees, designated representative and the assistant director in accordance with WAC 296-62-05201 through 296-62-05209 and WAC 296-62-05213 through 296-62-05217. These records shall also be provided upon request to the director of the department of labor and industries. Any physician who conducts a medical examination required by this subsection shall furnish to the employer of the examined employee all the information specifically required by this subsection, and any other medical information related to occupational exposure to tremolite, anthophyllite, and actinolite fibers.

TABLE 1--RESPIRATORY PROTECTION FOR TREMOLITE, ANTHOPHYLLITE, AND ACTINOLITE FIBERS

CONCENTRATION OF TREMOLITE, ANTHOPHYLLITE, ACTINOLITE, OR A COMBINATION OF THESE MINERALS	REQUIRED RESPIRATOR <sup>a</sup>
Not in excess of 2 f/cc.	1. Half-mask, air-purifying respirator equipped with high-efficiency cartridge filters. <sup>b</sup>
Not in excess of 10 f/cc.	1. Full facepiece air-purifying respirator equipped with high-efficiency filters.
Not in excess of 20 f/cc	1. Any powered air-purifying respirator equipped with high-efficiency filters. 2. Any supplied-air respirator operated in continuous flow mode.
Not in excess of 200 f/cc.	1. Full facepiece supplied-air respirator operated in pressure demand mode.
Greater than 200 f/cc or unknown concentration.	1. Full facepiece supplied-air respirator operated in pressure-demand mode equipped with either an auxiliary positive pressure self-contained breathing apparatus or a HEPA filter. 2. Full facepiece positive-pressure self-contained breathing apparatus (SCBA).

Note: a. Respirators assigned for higher environmental concentrations may be used at lower concentrations.

b. A high-efficiency filter means a filter that is capable of trapping and retaining at least 99.97 percent of all monodispersed particles of 0.3 micrometers mean aerodynamic diameter or larger.

[Statutory Authority: Chapter 49.17 RCW. 87-24-051 (Order 87-24), § 296-62-07761, filed 11/30/87.]

## PART J--BIOLOGICAL AND PHYSICAL AGENTS

WAC 296-62-080 Biological agents. (1) Definition. Biological agents are organisms or their by-products.

(2) Protection from exposure. Workmen shall be protected from exposure to hazardous concentrations of biological agents which may arise from processing, handling or using materials or waste.

[Order 73-3, § 296-62-080, filed 5/7/73; Order 70-8, § 296-62-080, filed 7/31/70, effective 9/1/70; Rule 8.010, effective 8/1/63.]

**WAC 296-62-090 Physical agents.**

[Order 73-3, § 296-62-090, filed 5/7/73; Order 70-8, § 296-62-090, filed 7/31/70, effective 9/1/70; Rule 9.010, effective 8/1/63.]

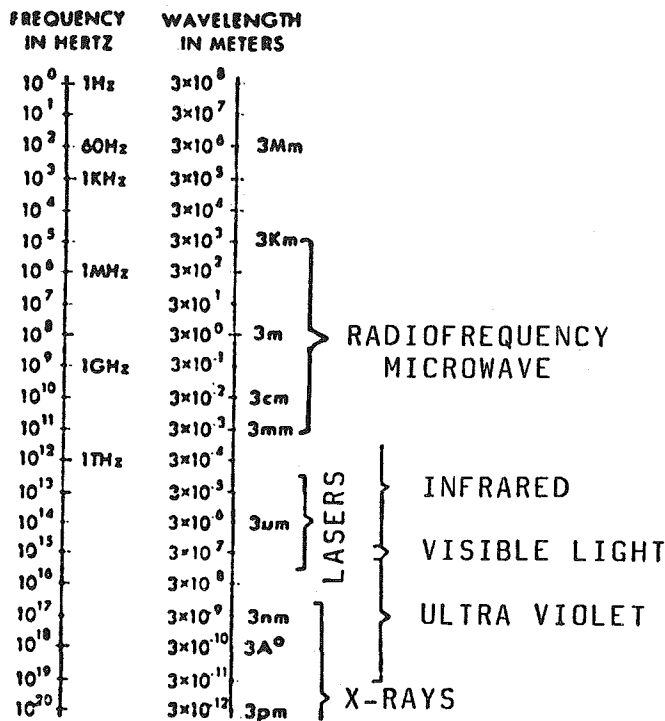
**WAC 296-62-09001 Definitions.** (1) "Physical agents" shall mean, but are not limited to: Illumination, ionizing radiation, nonionizing radiation, pressure, vibration, temperature and humidity, and noise.

(2) "Illumination" means radiant energy evaluated according to its capacity to produce visual sensation.

(3) "Nonionizing radiation" as related to industrial sources, means electromagnetic radiation within the spectral range of approximately 200 nanometers to 3 kilometers including ultraviolet, visible, infrared and radiofrequency/microwave radiation. The electromagnetic spectrum is shown graphically in Figure 1 below.

ELECTROMAGNETIC SPECTRUM

Figure 1



(4) Pressure is a barometric force. Positive pressure would be that above 14.7 lbs. per square inch absolute and negative pressure would be that below 14.7 lbs. per square inch absolute. 14.7 lbs. per square inch equals 760 mm. mercury.

(5) "Vibration" means rapid movement to and fro or oscillating movement.

(6) "Noise" means unwanted sound or loud discordant or disagreeable sound or sounds.

(7) "Temperature" means the degree of hotness or coldness measured by use of a thermometer.

(8) "Radiant heat" means infrared radiation emitted from hot surfaces.

(9) "Relative humidity" means the percent of moisture in the air compared to the maximum amount of moisture the air could contain at the same temperature.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 85-01-022 (Order 84-24), § 296-62-09001, filed 12/11/84; Order 73-3, § 296-62-09001, filed 5/7/73.]

**WAC 296-62-09003 Lighting and illumination.** (1) Lighting which is adequately adjusted to provide a margin of safety for all work tasks shall be provided and maintained.

(a) The minimum level of task lighting for all indoor activities shall be an average of 10 foot candles measured 30 inches above the floor or at the task.

(b) The minimum level of task lighting for all outdoor activities shall be an average of five foot candles measured thirty inches above the working surface or at the task.

(2) If general lighting is not provided throughout the work area, the employer shall provide illumination which is adequately adjusted to provide visibility of nearby objects which might be potential hazards or to see to operate emergency control or other equipment. The minimum level of nontask lighting for all indoor and outdoor activities shall be an average of 3 foot candles measured 30 inches above the floor or working surface.

Note: This section establishes minimal levels of illumination for safety purposes only. Guidelines pertaining to optimal levels of lighting and illumination may be found in Practice for Industrial Lighting, ANSI/IES RP7-1979. The minimum levels specified in subsections (1) and (2) of this section represent averages with the lowest level in an area to be no less than fifty percent of the indicated value.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 83-24-013 (Order 83-34), § 296-62-09003, filed 11/30/83; 82-13-045 (Order 82-22), § 296-62-09003, filed 6/11/82; Order 76-6, § 296-62-09003, filed 3/1/76; Order 73-3, § 296-62-09003, filed 5/7/73.]

**WAC 296-62-09004 Ionizing radiation.** (1) Definitions applicable to this section.

Note: Definitions also appear in some subsections.

(a) "Radiation" includes alpha rays, beta rays, gamma rays, x-rays, neutrons, high-speed electrons, high-speed protons, and other atomic particles; but such term does not include sound or radio waves, or visible light, or infrared or ultraviolet light.

(b) "Radioactive material" means any material which emits, by spontaneous nuclear disintegration, corpuscular or electromagnetic emanations.

(c) "Restricted area" means any area access to which is controlled by the employer for purposes of protection of individuals from exposure to radiation or radioactive materials.

(d) "Unrestricted area" means any area access to which is not controlled by the employer for purposes of

protection of individuals from exposure to radiation or radioactive materials.

(e) "Dose" means the quantity of ionizing radiation absorbed, per unit of mass, by the body or by any portion of the body. When the provisions in this section specify a dose during a period of time, the dose is the total quantity of radiation absorbed, per unit of mass, by the body or by any portion of the body during such period of time. Several different units of dose are in current use. Definitions of units used in this section are set forth in subdivisions (f) and (g) of this subsection.

(f) "Rad" means a measure of the dose of any ionizing radiation to body tissues in terms of the energy absorbed per unit of mass of the tissue. One rad is the dose corresponding to the absorption of 100 ergs per gram of tissue (1 millirad (mrad) = 0.001 rad).

(g) "Rem" means a measure of the dose of any ionizing radiation to body tissue in terms of its estimated biological effect relative to a dose of 1 roentgen (r) of x-rays (1 millirem (mrem) = 0.001 rem). The relation of the rem to other dose units depends upon the biological effect under consideration and upon the conditions for irradiation. Each of the following is considered to be equivalent to a dose of 1 rem:

(i) A dose of 1 roentgen due to x- or gamma radiation;

(ii) A dose of 1 rad due to x-, gamma, or beta radiation;

(iii) A dose of 0.1 rad due to neutrons or high energy protons;

(iv) A dose of 0.05 rad due to particles heavier than protons and with sufficient energy to reach the lens of the eye;

(v) If it is more convenient to measure the neutron flux, or equivalent, than to determine the neutron dose in rads, as provided in item (iii) of this subdivision, 1 rem of neutron radiation may, for purposes of the provisions in this section be assumed to be equivalent to 14 million neutrons per square centimeter incident upon the body; or, if there is sufficient information to estimate with reasonable accuracy the approximate distribution in energy of the neutrons, the incident number of neutrons per square centimeter equivalent to 1 rem may be estimated from the following table:

Neutron Flux Dose Equivalents

Neutron energy (million electron volts (Mev))	Number of neutrons per square centimeter equivalent to a dose of 1 rem (neutrons/cm <sup>2</sup> )	Average flux to deliver 100 millirem in 40 hours (neutrons/cm <sup>2</sup> per sec.)
Thermal --	970 X 10 <sup>6</sup>	670
0.0001 - - -	720 X 10 <sup>6</sup>	500
0.005 - - -	820 X 10 <sup>6</sup>	570
0.02 - - - -	400 X 10 <sup>6</sup>	280
0.1 - - - - -	120 X 10 <sup>6</sup>	80
0.5 - - - - -	43 X 10 <sup>6</sup>	30
1.0 - - - - -	26 X 10 <sup>6</sup>	18
2.5 - - - - -	29 X 10 <sup>6</sup>	20
5.0 - - - - -	26 X 10 <sup>6</sup>	18

(1989 Ed.)

## Neutron Flux Dose Equivalents

Neutron energy (million electron volts (Mev))	Number of neutrons per square centimeter equivalent to a dose of 1 rem (neutrons/cm <sup>2</sup> )	Average flux to deliver 100 millirem in 40 hours (neutrons/cm <sup>2</sup> per sec.)
7.5 - - - -	24 X 10 <sup>6</sup>	17
10 - - - - -	24 X 10 <sup>6</sup>	17
10 to 30 - -	14 X 10 <sup>6</sup>	10

(h) For determining exposures to x- or gamma rays up to 3 Mev., the dose limits specified in this section may be assumed to be equivalent to the "air dose." For the purpose of this section "air dose" means that the dose is measured by a properly calibrated appropriate instrument in air at or near the body surface in the region of the highest dosage rate.

(i) "Curie" means a unit of measurement of radioactivity. One curie (Ci) is that quantity of radioactive material which decays at the rate of  $2.2 \times 10^{12}$  disintegrations per minute (dpm).

(i) One millicurie (mCi) =  $10^{-3}$ Ci

(ii) One microcurie (uCi) =  $10^{-6}$ Ci

(iii) One nanocurie (nCi) =  $10^{-9}$ Ci

(iv) One picocurie (pCi) =  $10^{-12}$ Ci

(2) Nuclear Regulatory Commission licensees—NRC contractors operating NRC plants and facilities.

(a) Any employer who possesses or uses source material, byproduct material, or special nuclear material, as defined in the Atomic Energy Act of 1954, as amended, under a license issued by the Nuclear Regulatory Commission and in accordance with the requirements of chapter 402-24 WAC shall be deemed to be in compliance with the requirements of this section with respect to such possession and use.

(b) NRC contractors operating NRC plants and facilities: Any employer who possesses or uses source material, byproduct material, special nuclear material, or other radiation sources under a contract with the Nuclear Regulatory Commission for the operation of NRC plants and facilities and in accordance with the standards, procedures, and other requirements for radiation protection established by the commission for such contract pursuant to the Atomic Energy Act of 1954 as amended (42 U.S.C. 2011 et seq.) shall be deemed to be in compliance with the requirements of this section with respect to such possession and use.

(c) State licensees or registrants:

(i) Atomic Energy Act sources. Any employer who possesses or uses source material, byproduct material, or special nuclear material, as defined in the Atomic Energy Act of 1954, as amended (42 U.S.C. 2011 et seq.), and has registered such sources with, the state shall be deemed to be in compliance with the radiation requirements of this section, insofar as his possession and use of such material is concerned.

(ii) Other sources. Any employer who possesses or uses radiation sources other than source material, byproduct material, or special nuclear material, as defined

[Title 296 WAC—p 1553]

in the Atomic Energy Act of 1954, as amended (42 U.S.C. 2011 et seq.), and has registered such sources with the state shall be deemed to be in compliance with the radiation requirements of this section insofar as his possession and use of such material is concerned.

(3) Exposure of individuals to radiation in restricted areas.

(a) Except as provided in subdivision (b) of this subsection, no employer shall possess, use, or transfer sources of ionizing radiation in such a manner as to cause any individual in a restricted area to receive in any period of one calendar quarter from sources in the employer's possession or control a dose in excess of the limits specified in the following table:

EXPOSURE IN RESTRICTED AREAS	Rems per Calendar Quarter
Whole body: Head and trunk; active blood-forming organs; lens of eyes; or gonads	1 1/4
Hand and forearms; feet and ankles	18 3/4
Skin of whole body	7 1/2

(b) An employer may permit an individual in a restricted area to receive doses to the whole body greater than those permitted under subdivision (a) of this subsection, so long as:

(i) During any calendar quarter the dose to the whole body shall not exceed 3 rems; and

(ii) The dose to the whole body, when added to the accumulated occupational dose to the whole body, shall not exceed 5 (N-18) rems, where "N" equals the individual's age in years at his last birthday; and

(iii) The employer maintains adequate past and current exposure records which show that the addition of such a dose will not cause the individual to exceed the amount authorized in this subdivision. As used in this subdivision "Dose to the whole body" shall be deemed to include any dose to the whole body, gonad, active blood-forming organs, head and trunk, or lens of the eye.

(c) No employer shall permit any employee who is under 18 years of age to receive in any period of one calendar quarter a dose in excess of 10 percent of the limits specified in the preceding table entitled "exposure in restricted areas."

(d) "Calendar quarter" means any 3-month period determined as follows:

(i) The first period of any year may begin on any date in January: *Provided*, That the second, third and fourth periods accordingly begin on the same date in April, July, and October, respectively, and that the fourth period extends into January of the succeeding year, if necessary to complete a 3-month quarter. During the first year of use of this method of determination, the first period for that year shall also include any additional days in January preceding the starting date for the first period; or

(ii) The first period in a calendar year of 13 complete, consecutive calendar weeks; the second period in a calendar year of 13 complete consecutive weeks; the third period in a calendar year of 13 complete, consecutive

calendar weeks; the fourth period in a calendar year of 13 complete, consecutive calendar weeks. If at the end of a calendar year there are any days not falling within a complete calendar week of that year, such days shall be included within the last complete calendar week of that year. If at the beginning of any calendar year there are days not falling within a complete calendar week of that year, such days shall be included within the last complete calendar week of the previous year; or

(iii) The four periods in a calendar year may consist of the first 14 complete, consecutive calendar weeks; the next 12 complete, consecutive calendar weeks, the next 14 complete, consecutive calendar weeks, and the last 12 complete, consecutive calendar weeks. If at the end of a calendar year there are any days not falling within a complete calendar week of that year, such days shall be included (for purposes of this section) within the last complete calendar week of the year. If at the beginning of any calendar year there are days not falling within a complete calendar week of that year, such days shall be included (for purposes of this section) within the last complete week of the previous year.

(e) No employer shall change the method used by him to determine calendar quarters except at the beginning of a calendar year.

(4) Exposure to airborne radioactive material.

(a) No employer shall possess, use or transport radioactive material in such a manner as to cause any employee, within a restricted area, to be exposed to airborne radioactive material in an average concentration in excess of the limits specified in Table I of WAC 402-24-220, Appendix A. The limits given in Table I are for exposure to the concentrations specified for 40 hours in any workweek of 7 consecutive days. In any such period where the number of hours of exposure is less than 40 the limits specified in the table may be increased proportionately. In any such period where the number of hours of exposure is greater than 40, the limits specified in the table shall be decreased proportionately.

(b) No employer shall possess, use, or transfer radioactive material in such a manner as to cause any individual within a restricted area, who is under 18 years of age, to be exposed to airborne radioactive material in an average concentration in excess of the limits specified in Table II of WAC 402-24-220, Appendix A.

For purposes of this subdivision, concentrations may be averaged over periods not greater than 1 week.

(c) "Exposed" as used in this subdivision means that the individual is present in an airborne concentration. No allowance shall be made for the use of protective clothing or equipment, or particle size.

(5) Precautionary procedures and personal monitoring.

(a) Every employer shall make such surveys as may be necessary for him to comply with the provisions in this section. "Survey" means an evaluation of the radiation hazards incident to the production, use, release, disposal, or presence of radioactive materials or other sources of radiation under a specific set of conditions. When appropriate, such evaluation includes a physical

survey of the location of materials and equipment, and measurements of levels of radiation or concentrations of radioactive material present.

(b) Every employer shall supply appropriate personnel monitoring equipment, such as film badges, pocket chambers, pocket dosimeters, or film rings, to, and shall require the use of such equipment by:

(i) Each employee who enters a restricted area under such circumstances that he receives, or is likely to receive, a dose in any calendar quarter in excess of 25 percent of the applicable value specified in subsection (3)(a) of this section; and

(ii) Each employee under 18 years of age who enters a restricted area under such circumstances that he receives, or is likely to receive a dose in any calendar quarter in excess of 5 percent of the applicable value specified in subsection (3)(a) of this section; and

(iii) Each employee who enters a high radiation area.

(c) As used in this section:

(i) "Personnel monitoring equipment" means devices designed to be worn or carried by an individual for the purpose of measuring the dose received (e.g., film badges, pocket chambers, pocket dosimeters, film rings, etc.);

(ii) "Radiation area" means any area, accessible to personnel, in which there exists radiation at such levels that a major portion of the body could receive in any 1 hour a dose in excess of 5 millirem, or in any 5 consecutive days a dose in excess of 100 millirem; and

(iii) "High radiation area" means any area, accessible to personnel, in which there exists radiation at such levels that a major portion of the body could receive in any one hour a dose in excess of 100 millirem.

(6) Caution signs, labels and signals.

(a) General.

(i) Symbols prescribed by this subsection shall use the conventional radiation caution colors (magenta or purple on yellow background). The symbol prescribed by this subsection is the conventional three-bladed design:

#### RADIATION SYMBOL

1. Cross-hatched area is to be magenta or purple.
2. Background is to be yellow.

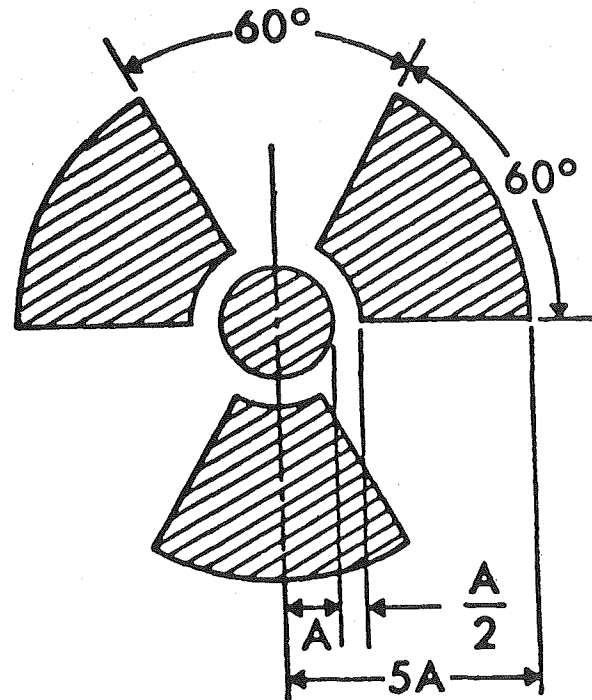


FIGURE G-10

(ii) In addition to the contents of signs and labels prescribed in this subsection, employers may provide on or near such signs and labels any additional information which may be appropriate in aiding individuals to minimize exposure to radiation or to radioactive material.

(b) Radiation area. Each radiation area shall be conspicuously posted with a sign or signs bearing the radiation caution symbol described in subdivision (a) of this subsection and the words:

CAUTION

RADIATION AREA

(c) High radiation area.

(i) Each high radiation area shall be conspicuously posted with a sign or signs bearing the radiation caution symbol and the words:

CAUTION

HIGH RADIATION AREA

(ii) Each high radiation area shall be equipped with a control device which shall either cause the level of radiation to be reduced below that at which an individual might receive a dose of 100 millirems in 1 hour upon entry into the area or shall energize a conspicuous visible or audible alarm signal in such a manner that the individual entering and the employer or a supervisor of the activity are made aware of the entry. In the case of a high radiation area established for a period of 30 days or less, such control device is not required.

(d) Airborne radioactivity area.

(i) As used in the provisions of this section, "airborne radioactivity area" means:

(A) Any room, enclosure, or operating area in which airborne radioactive materials, composed wholly or partly of radioactive material, exist in concentrations in excess of the amounts specified in column 1 of Table I of WAC 402-24-220, Appendix A.

(B) Any room, enclosure, or operating area in which airborne radioactive materials exist in concentrations which, averaged over the number of hours in any week during which individuals are in the area, exceed 25 percent of the amounts specified in column 1 of Table I of WAC 402-24-220, Appendix A.

(ii) Each airborne radioactivity area shall be conspicuously posted with a sign or signs bearing the radiation caution symbol described in subdivision (a) of this subsection and the words:

CAUTION

AIRBORNE RADIOACTIVITY AREA

(e) Additional requirements.

(i) Each area or room in which radioactive material is used or stored and which contains any radioactive material (other than natural uranium or thorium) in any amount exceeding 10 times the quantity of such material specified in WAC 402-24-230, Appendix B shall be conspicuously posted with a sign or signs bearing the radiation caution symbol described in subdivision (a) of this subsection and the words:

CAUTION

RADIOACTIVE MATERIALS

(ii) Each area or room in which natural uranium or thorium is used or stored in an amount exceeding 100 times the quantity of such material specified in chapter 402-24 WAC shall be conspicuously posted with a sign or signs bearing the radiation caution symbol described in subdivision (a) of this subsection and the words:

CAUTION

RADIOACTIVE MATERIALS

(f) Containers.

(i) Each container in which is transported, stored, or used a quantity of any radioactive material (other than natural uranium or thorium) greater than the quantity of such material specified in WAC 402-24-230, Appendix B shall bear a durable, clearly visible label bearing the radiation caution symbol described in subdivision (a) of this subsection and the words:

CAUTION

RADIOACTIVE MATERIALS

(ii) Each container in which natural uranium or thorium is transported, stored, or used in a quantity greater than 10 times the quantity specified in WAC 402-24-

230, Appendix B shall bear a durable, clearly visible label bearing the radiation caution symbol described in subdivision (a) of this subsection and the words:

CAUTION

RADIOACTIVE MATERIALS

(iii) Notwithstanding the provisions of items (i) and (ii) of this subdivision a label shall not be required:

(A) If the concentration of the material in the container does not exceed that specified in column 2 of Table I of WAC 402-24-220, Appendix A.

(B) For laboratory containers, such as beakers, flasks, and test tubes, used transiently in laboratory procedures, when the user is present.

(iv) Where containers are used for storage, the labels required in this subdivision shall state also the quantities and kinds of radioactive materials in the containers and the date of measurement of the quantities.

(7) Immediate evacuation warning signal.

(a) Signal characteristics.

(i) The signal shall be a midfrequency complex sound wave amplitude modulated at a subsonic frequency. The complex sound wave in free space shall have a fundamental frequency  $f'$  between 450 and 500 hertz (Hz) modulated at a subsonic rate between 4 and 5 hertz.

(ii) The signal generator shall not be less than 75 decibels at every location where an individual may be present whose immediate, rapid, and complete evacuation is essential.

(iii) A sufficient number of signal units shall be installed such that the requirements of item (i) of this subdivision are met at every location where an individual may be present whose immediate, rapid, and complete evacuation is essential.

(iv) The signal shall be unique in the plant or facility in which it is installed.

(v) The minimum duration of the signal shall be sufficient to insure that all affected persons hear the signal.

(vi) The signal-generating system shall respond automatically to an initiating event without requiring any human action to sound the signal.

(b) Design objectives.

(i) The signal-generating system shall be designed to incorporate components which enable the system to produce the desired signal each time it is activated within one-half second of activation.

(ii) The signal-generating system shall be provided with an automatically activated secondary power supply which is adequate to simultaneously power all emergency equipment to which it is connected, if operation during power failure is necessary, except in those systems using batteries as the primary source of power.

(iii) All components of the signal-generating system shall be located to provide maximum practicable protection against damage in case of fire, explosion, corrosive atmosphere, or other environmental extremes consistent with adequate system performance.

(iv) The signal-generating system shall be designed with the minimum number of components necessary to



make it function as intended, and should utilize components which do not require frequent servicing such as lubrication or cleaning.

(v) Where several activating devices feed activating information to a central signal generator, failure of any activating device shall not render the signal-generator system inoperable to activating information from the remaining devices.

(vi) The signal-generating system shall be designed to enhance the probability that alarm occurs only when immediate evacuation is warranted. The number of false alarms shall not be so great that the signal will come to be disregarded and shall be low enough to minimize personal injuries or excessive property damage that might result from such evacuation.

(c) Testing.

(i) Initial tests, inspections, and checks of the signal-generating system shall be made to verify that the fabrication and installation were made in accordance with design plans and specifications and to develop a thorough knowledge of the performance of the system and all components under normal and hostile conditions.

(ii) Once the system has been placed in service, periodic tests, inspections, and checks shall be made to minimize the possibility of malfunction.

(iii) Following significant alterations or revisions to the system, tests and checks similar to the initial installation tests shall be made.

(iv) Tests shall be designed to minimize hazards while conducting the tests.

(v) Prior to normal operation the signal-generating system shall be checked physically and functionally to assure reliability and to demonstrate accuracy and performance. Specific tests shall include:

(A) All power sources.

(B) Calibration and calibration stability.

(C) Trip levels and stability.

(D) Continuity of function with loss and return of required services such as AC or DC power, air pressure, etc.

(E) All indicators.

(F) Trouble indicator circuits and signals, where used.

(G) Air pressure (if used).

(H) Determine that sound level of the signal is within the limit of item (a)(ii) of this subsection at all points that require immediate evacuation.

(vi) In addition to the initial startup and operating tests, periodic scheduled performance tests and status checks must be made to insure that the system is at all times operating within design limits and capable of the required response. Specific periodic tests or checks or both shall include:

(A) Adequacy of signal activation device.

(B) All power sources.

(C) Function of all alarm circuits and trouble indicator circuits including trip levels.

(D) Air pressure (if used).

(E) Function of entire system including operation without power where required.

(F) Complete operational tests including sounding of the signal and determination that sound levels are adequate.

(vii) Periodic tests shall be scheduled on the basis of need, experience, difficulty, and disruption of operations. The entire system should be operationally tested at least quarterly.

(viii) All employees whose work may necessitate their presence in an area covered by the signal shall be made familiar with the actual sound of the signal—preferably as it sounds at their work location. Before placing the system into operation, all employees normally working in the area shall be made acquainted with the signal by actual demonstration at their work locations.

(8) Exceptions from posting requirements. Notwithstanding the provisions of subsection (6) of this section:

(a) A room or area is not required to be posted with a caution sign because of the presence of a sealed source, provided the radiation level 12 inches from the surface of the source container or housing does not exceed 5 millirem per hour.

(b) Rooms or other areas in onsite medical facilities are not required to be posted with caution signs because of the presence of patients containing radioactive material, provided that there are personnel in attendance who shall take the precautions necessary to prevent the exposure of any individual to radiation or radioactive material in excess of the limits established in the provisions of this section.

(c) Caution signs are not required to be posted at areas or rooms containing radioactive materials for periods of less than 8 hours: *Provided*, That

(i) The materials are constantly attended during such periods by an individual who shall take the precautions necessary to prevent the exposure of any individual to radiation or radioactive materials in excess of the limits established in the provisions of this section; and

(ii) Such area or room is subject to the employer's control.

(9) Exemptions for radioactive materials packaged for shipment. Radioactive materials packaged and labeled in accordance with regulations of the Department of Transportation published in 49 CFR Chapter I, are exempt from the labeling and posting requirements of this section during shipment, provided that the inside containers are labeled in accordance with the provisions of subsection (6) of this section.

(10) Instruction of personnel, posting.

(a) Employers regulated by the Nuclear Regulatory Commission shall be governed by 10 CFR Part 20 standards. Employers conducting business in Washington state shall be governed by the requirements of the laws and regulations of the state. All other employers shall be regulated by the following:

(b) All individuals working in or frequenting any portion of a radiation area shall be informed of the occurrence of radioactive materials or of radiation in such portions of the radiation area; shall be instructed in the safety problems associated with exposure to such materials or radiation and in precautions or devices to minimize exposure; shall be instructed in the applicable

provisions of this section for the protection of employees from exposure to radiation or radioactive materials; and shall be advised of reports of radiation exposure which employees may request pursuant to the regulations in this section.

(c) Each employer to whom this section applies shall post a current copy of its provisions and a copy of the operating procedures applicable to the work conspicuously in such locations as to insure that employees working in or frequenting radiation areas will observe these documents on the way to and from their place of employment, or shall keep such documents available for examination of employees upon request.

(11) Storage of radioactive materials. Radioactive materials stored in a nonradiation area shall be secured against unauthorized removal from the place of storage.

(12) Waste disposal. No employer shall dispose of radioactive material except as provided for in WAC 402-24-130.

(13) Notification of incidents.

(a) Immediate notification. Each employer shall immediately notify the industrial hygiene section, division of industrial safety and health for employees not protected by the Nuclear Regulatory Commission by means of 10 CFR Part 20; subsection (2)(b) of this section by telephone or telegraph of any incident involving radiation which may have caused or threatens to cause:

(i) Exposure of the whole body of any individual to 25 rems or more of radiation; exposure of the skin of the whole body of any individual to 150 rems or more of radiation; or exposure of the feet, ankles, hands, or forearms of any individual to 375 rems or more of radiation; or

(ii) The release of radioactive material in concentrations which, if averaged over a period of 24 hours, would exceed 5,000 times the limit specified for such materials in Table II of WAC 402-24-220, Appendix A.

(iii) A loss of 1 working week or more of the operation of any facilities affected; or

(iv) Damage to property in excess of \$100,000.

(b) Twenty-four hour notification. Each employer shall within 24 hours following its occurrence notify the industrial hygiene section, division of industrial safety and health, for employees not protected by the Nuclear Regulatory Commission by means of 10 CFR Part 20; subsection (2)(b) of this section, by telephone or telegraph of any incident involving radiation which may have caused or threatens to cause:

(i) Exposure of the whole body of any individual to 5 rems or more of radiation; exposure of the skin of the whole body of any individual to 30 rems or more of radiation; or exposure of the feet, ankles, hands, or forearms to 75 rems or more of radiation; or

(ii) A loss of 1 day or more of the operation of any facilities; or

(iii) Damage to property in excess of \$10,000.

(14) Reports of overexposure and excessive levels and concentrations.

(a) In addition to any notification required by subsection (13) of this section each employer shall make a report in writing within 30 days to the industrial hygiene

section division of industrial safety and health, for employees not protected by the Nuclear Regulatory Commission by means of 10 CFR Part 20; or under subsection (2)(b) of this section, of each exposure of an individual to radiation or concentrations of radioactive material in excess of any applicable limit in this section. Each report required under this subdivision shall describe the extent of exposure of persons to radiation or to radioactive material; levels of radiation and concentration of radioactive material involved, the cause of the exposure, levels of concentrations; and corrective steps taken or planned to assure against a recurrence.

(b) In any case where an employer is required pursuant to the provisions of this subsection to report to the industrial hygiene section, division of industrial safety and health, any exposure of an individual to radiation or to concentrations of radioactive material, the employer shall also notify such individual of the nature and extent of exposure. Such notice shall be in writing and shall contain the following statement: "You should preserve this report for future reference."

(15) Records.

(a) Every employer shall maintain records of the radiation exposure of all employees for whom personnel monitoring is required under subsection (5) of this section and advise each of his employees of his individual exposure on at least an annual basis.

(b) Every employer shall maintain records in the same units used in tables in subsection (2) of this section and WAC 402-24-220, Appendix A.

(16) Disclosure to former employee of individual employee's record.

(a) At the request of a former employee an employer shall furnish to the employee a report of the employee's exposure to radiation as shown in records maintained by the employer pursuant to subdivision (15)(a) of this section. Such report shall be furnished within 30 days from the time the request is made, and shall cover each calendar quarter of the individual's employment involving exposure to radiation or such lesser period as may be requested by the employee. The report shall also include the results of any calculations and analysis of radioactive material deposited in the body of the employee. The report shall be in writing and contain the following statement: "You should preserve this report for future reference."

(b) The former employee's request should include appropriate identifying data, such as social security number and dates and locations of employment.

(17) (Reserved)

(18) Radiation standards for mining.

(a) For the purpose of this subsection, a "working level" is defined as any combination of radon daughters in 1 liter of air which will result in the ultimate emission of  $1.3 \times 10^5$  million electron volts of potential alpha energy. The numerical value of the "working level" is derived from the alpha energy released by the total decay of short-lived radon daughter products in equilibrium with 100 picocuries of radon 222 per liter of air. A working level month is defined as the exposure received

by a worker breathing air at one working level concentration for 4-1/3 weeks of 40 hours each.

(b) Occupational exposure to radon daughters in mines shall be controlled so that no individual will receive an exposure of more than 2 working level months in any calendar quarter and no more than 4 working level months in any calendar year. Actual exposures shall be kept as far below these values as practicable.

(c)(i) For uranium mines, records of environmental concentrations in the occupied parts of the mine, and of the time spent in each area by each person involved in an underground work shall be established and maintained. These records shall be in sufficient detail to permit calculations of the exposures, in units of working level months, of the individuals and shall be available for inspection by the industrial hygiene section, division of safety and health or their authorized representatives.

(ii) For other than uranium mines and for surface workers in all mines, item (i) of this subdivision will be applicable: *Provided, however,* That if no environmental sample shows a concentration greater than 0.33 working level in any occupied part of the mine, the maintenance of individual occupancy records and the calculation of individual exposures will not be required.

(d)(i) At the request of an employee (or former employee) a report of the employee's exposure to radiation as shown in records maintained by the employer pursuant to subdivision (c) of this subsection shall be furnished to him. The report shall be in writing and contain the following statement:

"This report is furnished to you under the provisions of the state of Washington, Ionizing Radiation Safety and Health Standards (chapter 296-62 WAC). You should preserve this report for future reference."

(ii) The former employee's request should include appropriate identifying data, such as Social Security number and dates and locations of employment. See tables in WAC 402-24-220, Appendix A and 402-24-230, Appendix B.

[Statutory Authority: RCW 49.17.040 and 49.17.050, 85-01-022 (Order 84-24), § 296-62-09004, filed 12/11/84; Order 75-15, § 296-62-09004, filed 4/18/75.]

**WAC 296-62-09005 Nonionizing radiation.** (1) Introduction. Employees shall be protected from exposure to hazardous levels of nonionizing radiation. Health standards have been established for ultraviolet, radiofrequency/microwave, and laser radiations which shall be used to promote a healthful working environment. These standards refer to levels of nonionizing radiation and represent conditions under which it is believed that nearly all workers may be repeatedly exposed day after day without adverse effects. They are

based on the best available information from experimental studies. Because of the wide variations in individual susceptibility, exposure of an occasional individual at, or even below, the permissible limit, may result in discomfort, aggravation of a preexisting condition, or physiological damage.

(a) Permissible exposure limits (PELs) refer to a time weighted average (TWA) of exposure for an 8-hour work day within a 40-hour workweek. Exceptions are those limits which are given a ceiling value.

(b) These PELs should be interpreted and applied only by technically qualified persons.

(c) Ceiling value. There are nonionizing radiations which produce physiological responses from short intense exposure and the PELs for these radiations are more appropriately based on this particular hazard. Nonionizing radiations with this type of hazard are best controlled by a ceiling value which is a maximum level of exposure which shall not be exceeded.

(2) The employer shall establish and maintain a program for the control and monitoring of nonionizing radiation hazards. This program shall provide employees adequate supervision, training, facilities, equipment, and supplies, for the control and assessment of nonionizing radiation hazards.

(3) Radiofrequency/microwave radiation permissible exposure limits.

(a) Definition: "Partial body exposure" means the case in which only the hands and forearms or the feet and legs below the knee are exposed.

(b) Warning symbol.

(i) The warning symbol for radiofrequency/microwave radiation shall consist of a red isosceles triangle above an inverted black isosceles triangle, separated and outlined by an aluminum color border. The words "Warning - Radiofrequency/microwave radiation hazard" shall appear in the upper triangle. See Figure 1.

(ii) All areas where entry may result in an exposure to radiofrequency/microwave radiation in excess of the PEL shall have a warning symbol prominently displayed at their entrance.

(iii) American National Standard Safety Color Code for Marking Physical Hazards and the Identification of Certain Equipment, Z53.1-1953, shall be used for color specification. All lettering and the border shall be of aluminum color.

(iv) The inclusion and choice of warning information or precautionary instructions is at the discretion of the user. If such information is included it shall appear in the lower triangle of the warning symbol.



1. Place handling and mounting instructions on reverse side.
2. D = Scaling Unit.
3. Lettering: Ratio of letter height to thickness of letter lines.
  - Upper triangle: 5 to 1 Large
  - 6 to 1 Medium
  - Lower triangle: 4 to 1 Small
  - 6 to 1 Medium
4. Symbol is square, triangles are right-angle isosceles.

Figure 1

Radiofrequency/Microwave Radiation Hazard Warning Symbol

(c) These PELs refer to radiofrequency/microwave radiation exposures in the frequency range of 300 kHz to 100 GHz. Based on current knowledge, it is believed that workers may be exposed at these PELs without adverse health effects.

(i) Table I gives the PELs in terms of the mean squared electric ( $E^2$ ) and magnetic ( $H^2$ ) field strengths and in terms of the equivalent plane-wave free-space power density, as a function of frequency.

(ii) The average exposure for any 6 minute (0.1 hour) period shall not exceed the PEL.

(iii) Measurements shall be made at distances of 5 cm or greater from any object.

(iv) For mixed or broadband fields at a number of frequencies for which there are different PELs, the fraction of the PEL incurred within each frequency interval shall be determined and the sum of these fractions shall not exceed unity.

(v) PELs given in Table I for frequencies between 300 kHz and 1 GHz may be exceeded for partial body exposures if the output power of the radiating device is 7 watts or less.

Table I. Radiofrequency/Microwave Radiation Permissible Exposure Limits (PELs).

Frequency(f)	Power Density*	Electric Field Strength Squared*	Magnetic Field Strength Squared*
	mW/cm <sup>2</sup>	V <sup>2</sup> /m <sup>2</sup>	A <sup>2</sup> /m <sup>2</sup>
0.3 to 3 MHz	100	400,000	2.5
3 to 30 MHz	900/f <sup>2</sup>	4000(900/f <sup>2</sup> )	0.025(900/f <sup>2</sup> )
30 to 300 MHz	1.0	4000	0.025
300 to 1500 MHz	f/300	4000(f/300)	0.025(f/300)
1.5 to 100 GHz	5.0	20,000	0.125

Note: f=frequency (MHz)

\* Ceiling value

(4) Laser radiation permissible exposure limits.

(a) Definitions.

(i) "Diffuse reflection" means a change of the spatial distribution of a beam of radiation when it is reflected in many directions by a surface or medium.

(ii) "Specular reflection" means a mirrorlike reflection.

(iii) "Accessible radiation" means laser radiation to which human access is possible.

(b) All lasers and laser systems shall be classified in accordance with the Federal Laser Product Performance Standards (21 CFR 1040.10) or, if manufactured prior to August 2, 1976, in accordance with ANSI Z136.1-1980.

(i) Class I. Laser systems that are considered to be incapable of producing damaging radiation levels and are thereby exempt from control measures. This is a no hazard category.

(ii) Class II. Visible wavelength laser systems that have a low hazard potential because of the expected aversion response. There is some possibility of injury if stared at. This is a low hazard category.

(iii) Class III. Laser systems in which intrabeam viewing of the direct beam or specular reflections of the beam may be hazardous. This class is further subdivided into IIIa and IIIb. This is a moderate hazard category.

(iv) Class IV. Laser systems whose direct or diffusely reflected radiation may be hazardous and where the beam may constitute a fire hazard. Class IV systems require the use of controls that prevent exposure of the eye and skin to specular or diffuse reflections of the beam. This is a high hazard category.

(c) Warning signs and classification labels shall be prepared in accordance with 21 CFR 1040.10 when classifying lasers and laser systems, and ANSI Z136.1 - 1980 when using classified lasers and laser systems. All signs and labels shall be conspicuously displayed.

(i) The signal word "CAUTION" shall be used with all signs and labels associated with Class II and Class IIIa lasers and laser systems.

(ii) The signal word "DANGER" shall be used with all signs and labels associated with Class IIIb and Class IV lasers and laser systems.

(d) Personal protective equipment shall be provided at no cost to the employee and shall be worn whenever operational conditions or maintenance of lasers may result in a potentially hazardous exposure.

(i) Protective eyewear shall be specifically designed for protection against radiation of the wavelength and radiant energy of the laser or laser system. Ocular exposure shall not exceed the recommendations of ANSI Z136.1 - 1980.

(ii) For Class IV lasers and laser systems protective eyewear shall be worn for all operational conditions or maintenance which may result in exposures to laser radiation.

(e) Engineering controls shall be used whenever feasible to reduce the accessible radiation levels for Class IV lasers and laser systems to a lower classification level. These controls may include, but are not limited to: Protective housings, interlocks, optical system attenuators,

enclosed beam paths, remote controls, beam stops, and emission delays with audible warnings.

(f) All employees who may be exposed to laser radiation shall receive laser safety training. The training shall ensure that the employees are knowledgeable of the potential hazards and control measures for the laser equipment in use.

(5) Ultraviolet radiation.

(a) These permissible exposure limits refer to ultraviolet radiation in the spectral region between 200 and 400 nanometer (nm) and represent conditions under which it is believed that nearly all workers may be repeatedly exposed without adverse effect. These values for exposure of the eye or the skin apply to ultraviolet radiation from arcs, gas, and vapor discharges, and incandescent sources, but do not apply to ultraviolet lasers or solar radiation. These levels should not be used for determining exposure of photosensitive individuals to ultraviolet radiation. These values shall be used in the control of exposure to continuous sources where the exposure relation shall not be less than 0.1 sec.

(b) The permissible exposure limit for occupational exposure to ultraviolet radiation incident upon skin or eye where irradiance values are known and exposure time is controlled are as follows:

(i) For the near ultraviolet spectral region (320 to 400 nanometer (nm)) total irradiance incident upon the unprotected skin or eye shall not exceed milliwatt/sq. centimeter for periods greater than  $10^3$  seconds (approximately 16 minutes) and for exposure times less than 103 seconds shall not exceed one Joules/sq. centimeter.

(ii) For the actinic ultraviolet spectral region (200 - 315 nm), radiant exposure incident upon the unprotected skin or eye shall not exceed the values given in Table 4 within an 8-hour period.

(iii) To determine the effective irradiance of a broad-band source weighted against the peak of the spectral effectiveness curve (270 nanometer (nm)), the following weighting formulas shall be used.

$$E_{\text{eff}} = \sum (E-\text{Lambda}) (S-\text{Lambda}) (\text{Delta}-\text{Lambda})$$

Where:

$E_{\text{eff}}$  = effective irradiance relative to a monochromatic source at 270nm

$E-\text{Lambda}$  = spectral irradiance in Watts/sq. centimeter/nanometer.

$S-\text{Lambda}$  = relative spectral effectiveness (unitless)

$\text{Delta}-\text{Lambda}$  = band width in nanometers

(iv) Permissible exposure time in seconds for exposure to actinic ultraviolet radiation incident upon the unprotected skin or eye may be computed by dividing 0.003 Joules/sq. centimeter by  $E_{\text{eff}}$  in Watts/sq. centimeter. The exposure time may also be determined using Table 5 which provides exposure times corresponding to effective irradiances in  $\mu\text{W}/\text{cm}^2$ .

TABLE 4

Wavelength nanometer	PEL millijoules/sq. centimeters	Relative Spectral Effectiveness S Lambda
200	100	0.03
210	40	0.075
220	25	0.12
230	16	0.19
240	10	0.30
250	7.0	0.43
254	6.0	0.5
260	4.6	0.65
270	3.0	1.0
280	3.4	0.88
290	4.7	0.64
300	10	0.30
305	50	0.06
310	200	0.015
315	1000	0.003

TABLE 5

Duration of Exposure Per Day	Effective Irradiance $E_{\text{eff}}$ ( $\mu\text{W}/\text{cm}^2$ )
8 hrs.	0.1
4 hrs.	0.2
2 hrs.	0.4
1 hr.	0.8
1/2 hr.	1.7
15 min.	3.3
10 min.	5
5 min.	10
1 min.	50
30 sec.	100
10 sec.	300
1 sec.	3,000
0.5 sec.	6,000
0.1 sec.	30,000

TABLE 6

Densities and Transmissions (in Percent); also Tolerances in Densities and Transmissions of Various Shades of Glasses for Protection Against Injurious Rays

(Shades 3 to 8, inclusive, are for use in goggles, shades 10 to 14, inclusive, for welder's helmets and face shields)

[CODIFICATION NOTE: The graphic presentation of this table has been varied slightly in order that it would fall within the printing specifications for the Washington Administrative Code. In the following table, the original table had columns relating to (1) "Optical Density" which is now "Part 1," (2) "Total Visible Luminous Transmittance" and "Maximum total Infrared" which are now "Part 2," (3) "Maximum Ultraviolet Transmission" which is now "Part 3," and (4) "Recommended Uses" which is now "Part 4." These columns were all positioned side by side. In the new WAC format these are split up into four separate tables.]

TABLE 6--Part 1

Shade No.	Optical Density		
	Minimum O.D.	Standard O.D.	Maximum O.D.
3.0	.64	.857	1.06
4.0	1.07	1.286	1.49
5.0	1.50	1.714	1.92
6.0	1.93	2.143	2.35
7.0	2.36	2.572	2.78
8	2.79	3.000	3.21
9	3.22	3.429	3.63
10	3.64	3.857	4.06
11	4.07	4.286	4.49
12	4.50	4.715	4.92
13	4.93	5.143	5.35
14	5.36	5.571	5.78

TABLE 6--Part 2

Shade No.	Total Visible Luminous Transmittance			Maximum Total Infrared %
	Maximum %	Standard %	Minimum %	
3.0	22.9	13.9	8.70	9.0
4.0	8.51	5.18	3.24	5.0
5.0	3.16	1.93	1.20	2.5
6.0	1.18	.72	.45	1.5
7.0	.44	.27	.17	1.3
8	.162	.100	.062	1.0
9	.060	.037	.023	.8
10	.0229	.0139	.0087	.6
11	.0085	.0052	.0033	.5
12	.0032	.0019	.0012	.5
13	.00118	.00072	.00045	.4
14	.00044	.00027	.00017	.3

TABLE 6--Part 3

Shade No.	Maximum Ultraviolet Transmission			
	313mu %	334mu %	365mu %	405mu %
3.0	.2	.2	.5	1.0
4.0	.2	.2	.5	1.0
5.0	.2	.2	.2	.5
6.0	.1	.1	.1	.5
7.0	.1	.1	.1	.5
8	.1	.1	.1	.5
9	.1	.1	.1	.5
10	.1	.1	.1	.5
11	.05	.05	.05	.1
12	.05	.05	.05	.1
13	.05	.05	.05	.1
14	.05	.05	.05	.1

TABLE 6--Part 4

Shade No.	Recommended Uses
3.0	Glare of reflected sunlight from snow, water, sand, etc., stray light from cutting and welding metal pouring and work around furnaces and foundries.
4.0 5.0	Light acetylene cutting and welding; light electric spot welding.
6.0 7.0	Acetylene cutting and medium welding; arc welding up to 30 amperes.
8 9	Heavy acetylene welding; arc cutting and welding between 30 and 75 amperes.
10 11	Arc cutting and welding between 75 and 200 amperes.
12 13	Arc cutting and welding between 200 and 400 amperes.
14	Arc cutting and welding above 400 amperes.

- a. American Standard Safety Code for the Protection of Heads, Eyes, and Respiratory Organs.
- b. Standard density is defined as the logarithms (base 10) of the reciprocal of the transmission. Shade number is determined by the density according to the relations:

Shade number =  $7/3$  density + 1 with tolerances as given in the table.

Note: Safety glasses are available with lenses which protect the eyes against ultraviolet radiation.

[Statutory Authority: RCW 49.17.040 and 49.17.050, 85-01-022 (Order 84-24), § 296-62-09005, filed 12/11/84. Statutory Authority: RCW 49.17.040, 80-16-029 (Order 80-22), § 296-62-09005, filed 10/31/80. Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240, 80-11-010 (Order 80-14), § 296-62-09005, filed 8/8/80; Order 73-3, § 296-62-09005, filed 5/7/73.]

**WAC 296-62-09007 Pressure.** (1) Workmen exposed to pressures above normal atmospheric pressure which may produce physiological injury shall adhere to decompression schedules or other tables as are or may be adopted by the department of labor and industries: for example, state of Washington "safety standards for compressed air work" and "safety regulations for scuba diving." The employer shall provide and supervise the use of decompression equipment and schedules in accordance with applicable requirements.

(2) If no specific requirements prevail for an unusual condition, a plan based on the recommendations of professionally qualified advisors, experienced with hazards associated with such exposures, shall be followed by both the employer and employee.

[Order 73-3, § 296-62-09007, filed 5/7/73.]

**WAC 296-62-09009 Vibration.** Reasonable precautions shall be taken to protect workmen against the hazardous effects of unavoidable exposure to vibrations.

[Order 73-3, § 296-62-09009, filed 5/7/73.]

**WAC 296-62-09013 Temperature, radiant heat, or temperature-humidity combinations.** (1) Workmen subjected to temperature extremes, radiant heat, humidity, or air velocity combinations which, over a period of time, are likely to produce physiological responses which are harmful shall be afforded protection by use of adequate controls, methods or procedures, or protective clothing. This shall not be construed to apply to normal occupations under atmospheric conditions which may be expected in the area except that special provisions which are required by other regulations for certain areas or occupations shall prevail.

[Order 73-3, § 296-62-09013, filed 5/7/73.]

## PART K--HEARING CONSERVATION

**WAC 296-62-09015 Hearing conservation.** The employer shall administer a continuing effective hearing conservation program, as described in WAC 296-62-09015 through 296-62-09055 whenever employee noise

exposures equal or exceed an 8-hour time-weighted average (TWA) sound level of 85 decibels (dB) measured on the A-scale weighting at slow response or, equivalently, a noise dose of fifty percent. For purposes of the hearing conservation program, employee noise exposures shall be computed in accordance with WAC 296-62-09055, Appendix E: Noise exposure computation, without regard to any attenuation provided by the use of personal protective equipment.

[Statutory Authority: RCW 49.17.040 and 49.17.050, 83-24-013 (Order 83-34), § 296-62-09015, filed 11/30/83; 82-03-023 (Order 82-1), § 296-62-09015, filed 1/15/82.]

**WAC 296-62-09017 Definitions.** These definitions apply to the following terms as used in WAC 296-62-09015 through 296-62-09055.

(1) **Audiogram** - A chart, graph, or table resulting from an audiometric test showing an individual's hearing threshold levels as a function of frequency.

(2) **Audiologist** - A professional, specializing in the study and rehabilitation of hearing, who is certified by the American Speech, Hearing, and Language Association or licensed by a state board of examiners.

(3) **Baseline audiogram** - The audiogram against which future audiograms are compared.

(4) **Criterion sound level** - A sound level of 90 decibels.

(5) **Decibel (dB)** - Unit of measurement of sound level.

(6) **Hertz (Hz)** - Unit of measurement of frequency, numerically equal to cycles per second.

(7) **Impulsive or impact noise** - Noise levels which involve maxima at intervals greater than one second. Where the intervals are less than one second, the noise levels shall be considered continuous.

(8) **Medical pathology** - A disorder or disease. For purposes of this regulation, a condition or disease affecting the ear, which should be treated by a physician specialist.

(9) **Noise dose** - The ratio, expressed as a percentage, of (a) the time integral, over a stated time or event, of the 0.6 power of the measured SLOW exponential time-averaged, squared A-weighted sound pressure and (b) the product of the criterion duration (8 hours) and the 0.6 power of the squared sound pressure corresponding to the criterion sound level (90 dB).

(10) **Noise dosimeter** - An instrument that integrates a function of sound pressure over a period of time in such a manner that it directly indicates a noise dose.

(11) **Otolaryngologist** - A physician specializing in diagnosis and treatment of disorders of the ear, nose and throat.

(12) **Representative exposure** - Measurements of an employee's noise dose or 8-hour time-weighted average sound level that the employer deems to be representative of the exposure of other employees in the workplace.

(13) **Standard threshold shift** - A hearing level change, relative to the baseline audiogram, of an average of 10 dB or more at 2000, 3000, and 4000 Hz in either ear.



(14) Sound level – Ten times the common logarithm of the ratio of the the square of the measured A-weighted sound pressure to the square of the standard reference pressure of 20 micropascals. Unit: Decibels (dB). For use with this regulation, SLOW time response, in accordance with ANSI S1.4-1971 (R1976), is required unless specifically specified otherwise.

(15) Sound level meter – An instrument for the measurement of sound level.

(16) Time-weighted average sound level – That sound level, which if constant over an 8-hour period, would result in the same noise dose as if measured in the time varying noise level environment.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 83-24-013 (Order 83-34), § 296-62-09017, filed 11/30/83; 82-03-023 (Order 82-1), § 296-62-09017, filed 1/15/82.]

**WAC 296-62-09019 Monitoring.** (1) When reasonable information indicates that any employee's exposure may equal or exceed an 8-hour time-weighted average of 85 dBA, the employer shall obtain individual or representative exposure measurements for all employees who may be exposed at or above that level.

(2) The sampling strategy shall be designed to identify all employees required to be included in the hearing conservation program and to enable the proper selection of hearing protectors.

(3) Where circumstances such as high worker mobility, significant variations in sound level, or a significant component of impulse noise exist, the employer shall use representative personal sampling to comply with the monitoring requirements of this section unless the employer can establish that area sampling produces equivalent results.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 83-24-013 (Order 83-34), § 296-62-09019, filed 11/30/83; 82-03-023 (Order 82-1), § 296-62-09019, filed 1/15/82.]

**WAC 296-62-09021 Method of noise measurement.**

(1) Noise dosimeters which comply, as a minimum, with the provisions of subdivision (1)(a) of this section or sound level meters which comply, as a minimum, with the provisions of subdivision (1)(b) of this section shall be used whenever employee exposures are evaluated for the purpose of complying with WAC 296-62-09015 through 296-62-09055.

(a) Dosimeters. Dosimeters shall meet the Class 2A-90/80-5 requirements of the American National Standard Specification for Personal Noise Dosimeters, S1.25-1978.

(b) Sound level meters. Sound level meters shall meet the Type 2 requirements of the American National Standard Specification for Sound Level Meters, S1.4-1971 (R1976).

(2) All continuous, intermittent, and impulsive sound levels from 80 dBA to 130 dBA shall be integrated into the exposure computation.

(3) Monitoring shall be repeated whenever a change in production, process, equipment or controls increases noise exposures to the extent that:

(a) Additional employees may be exposed at or above an 8-hour time-weighted average of 85 dBA; or

(b) The attenuation provided by hearing protectors being used by employees may be rendered inadequate to meet the requirements of WAC 296-62-09033.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 83-24-013 (Order 83-34), § 296-62-09021, filed 11/30/83; 82-03-023 (Order 82-1), § 296-62-09021, filed 1/15/82.]

**WAC 296-62-09023 Calibration of monitoring equipment.** Dosimeters and sound level meters used to monitor employee noise exposure shall be calibrated using the instrument manufacturer's calibration instructions before and after each day's use.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 83-24-013 (Order 83-34), § 296-62-09023, filed 11/30/83; 82-03-023 (Order 82-1), § 296-62-09023, filed 1/15/82.]

**WAC 296-62-09024 Employee notification.** The employer shall notify each employee exposed at or above an 8-hour time-weighted average of 85 dBA of the results of the monitoring.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 83-24-013 (Order 83-34), § 296-62-09024, filed 11/30/83.]

**WAC 296-62-09025 Observation of monitoring.** The employer shall provide affected employees or their representatives with an opportunity to observe any measurements of employee noise exposure which are conducted pursuant to WAC 296-62-09019.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 82-03-023 (Order 82-1), § 296-62-09025, filed 1/15/82.]

**WAC 296-62-09026 Noise control.** (1) Whenever employee noise exposures equal or exceed an 8-hour time-weighted average of 90 dBA, feasible administrative or engineering controls shall be utilized.

(2) Upon request, the employer shall prepare and submit a written compliance plan to the director or his/her designee. This plan must include a description of the manner in which compliance will be achieved with respect to cited violations of WAC 296-62-09026(1) and shall include proposed abatement methods, anticipated completion dates, and provision for progress reports to the director or his/her designee.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 83-24-013 (Order 83-34), § 296-62-09026, filed 11/30/83.]

**WAC 296-62-09027 Audiometric testing program.**

(1) The employer shall establish and maintain a mandatory audiometric testing program as provided in this section for all employees whose exposures equal or exceed an 8-hour time-weighted average of 85 dBA.

(2) The program shall be provided at no cost to employees.

(3) Audiometric tests shall be performed by a licensed or certified audiologist, otolaryngologist, or other qualified physician, or by a technician who is certified by the council of accreditation in occupational hearing conservation. A technician who performs audiometric tests must be responsible to an audiologist, otolaryngologist or other qualified physician.

(4) All audiograms obtained pursuant to this section shall meet the requirements of WAC 296-62-09047, Appendix A: Audiometric measuring instruments.

(5) Baseline audiogram.

(a) Prior to or within 180 days after an employee's first exposure to noise at or above a time-weighted average of 85 dBA, the employer shall establish for each employee so exposed a valid baseline audiogram against which subsequent audiograms can be compared. Employers who utilize mobile test units are allowed up to one year to obtain a valid baseline audiogram for each exposed employee, provided that each employee so exposed shall be trained and shall wear suitable hearing protectors in accordance with WAC 296-62-09015 through 296-62-09055.

(b) Testing to establish a baseline audiogram shall be preceded by at least 14 hours without exposure to workplace noise.

This may be accomplished by use of hearing protectors; however, the employer shall notify employees of the need to avoid high levels of nonoccupational noise exposure during the 14-hour period immediately preceding the audiometric examination.

(6) Annual audiogram.

(a) At least annually (i.e. every 12-month interval) after obtaining the baseline audiogram, the employer shall obtain a new audiogram for each employee exposed at or above a time-weighted average of 85 dBA.

(b) Annual audiometric testing may be conducted at any time during the workshift.

(7) Evaluation of audiogram.

(a) Each employee's annual audiogram shall be compared to that employee's baseline audiogram to determine if a standard threshold shift has occurred. This comparison may be made by a certified audiometric technician.

(b) If the annual audiogram indicates that an employee has suffered a standard threshold shift, the employer may obtain a retest within 30 days and consider the results of the retest as the annual audiogram.

(c) An audiologist, otolaryngologist or other qualified physician shall review audiograms which indicate a standard threshold shift to determine whether there is need for further evaluation. The employer shall provide to the person performing this evaluation the following information:

(i) A copy of the requirements for hearing conservation as set forth in WAC 296-62-09015 through 296-62-09055;

(ii) The baseline audiogram and most recent audiogram of the employee to be evaluated;

(iii) Measurements of background sound pressure levels in the audiometric test room as required in WAC 296-62-09049, Appendix B: Audiometric test rooms; and

(iv) Records of audiometer calibrations required by WAC 296-62-09029(5).

(d) Inform each employee of the results of his/her audiometric test and whether or not there has been a hearing level decrease or improvement since his/her previous test.

(8) Follow-up procedures. If a comparison of the annual audiogram to the baseline audiogram indicates a standard threshold shift, the employer shall ensure that the following steps are taken:

(a) Employees not using hearing protectors shall be fitted with hearing protectors, trained in their use and care, and required to use them.

(b) Employees already using hearing protectors shall be refitted and retrained in the use of hearing protectors and provided with hearing protectors offering greater attenuation if necessary.

(c) Inform the employee in writing, within 21 days of the determination, of the existence of a standard threshold shift;

(d) Refer the employee, at no cost to the employee, for a clinical audiological evaluation or an otological examination, as appropriate, if additional testing is necessary or if the employer suspects that a medical pathology of the ear (as defined in WAC 296-62-09017) is caused or aggravated by the wearing of hearing protectors; and

(e) Inform the employee of the need for an otological examination if a medical pathology of the ear which is unrelated to the use of hearing protectors is suspected.

(9) Revised baseline. An annual audiogram may be substituted for the baseline audiogram when, in the judgment of the audiologist, otolaryngologist or other qualified physician who is evaluating the audiogram:

(a) The standard threshold shift revealed by the audiogram is persistent; or

(b) The hearing threshold shown in the annual audiogram indicates significant improvement over the baseline audiogram.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 83-24-013 (Order 83-34), § 296-62-09027, filed 11/30/83; 82-03-023 (Order 82-1), § 296-62-09027, filed 1/15/82.]

**WAC 296-62-09029 Audiometric test requirements.**

(1) Audiometric tests shall be pure tone, air conduction, hearing threshold examinations, with test frequencies including as a minimum 500, 1000, 2000, 3000, 4000, and 6000 Hz. Tests at each frequency shall be taken separately for each ear.

(2) Audiometric tests shall be conducted with audiometers (including microprocessor audiometers) that meet the specifications of, and are maintained and used in accordance with, American National Standard Specification for Audiometers, S3.6-1969(R1973).

(3) Pulsed-tone and self-recording audiometers, if used, shall meet the requirements specified in WAC 296-62-09047, Appendix A: Audiometric measuring instruments.

(4) Audiometric examinations shall be administered in a room meeting the requirements listed in WAC 296-62-09049, Appendix B: Audiometric test rooms.

(5) Audiometer calibration.

(a) The functional operation of the audiometer shall be checked before each day's use by testing a person with known, stable hearing thresholds, and by listening to the audiometer's output to make sure that the output

is free from distorted or unwanted sounds. Deviations of 10 dB or greater shall require an acoustic calibration.

(b) Audiometer calibration shall be checked acoustically at least annually in accordance with WAC 296-62-09051, Appendix C: Acoustic calibration of audiometers. Test frequencies below 500 Hz and above 6000 Hz may be omitted from this check.

(c) An exhaustive calibration shall be performed at least every two years in accordance with sections 4.1.2; 4.1.3; 4.1.4.3; 4.2; 4.4.1; 4.4.2; 4.4.3; and 4.5 of the American National Standard Specification for Audiometers, S3.6-1969(R1973). Test frequencies below 500 Hz and above 6000 Hz may be omitted from the calibration.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 83-24-013 (Order 83-34), § 296-62-09029, filed 11/30/83; 82-03-023 (Order 82-1), § 296-62-09029, filed 1/15/82.]

**WAC 296-62-09031 Hearing protectors.** (1) Employers shall make hearing protectors available to all employees exposed to a time-weighted average of 85 dBA or greater at no cost to the employees. Hearing protectors shall be replaced as necessary.

(2) Employers shall ensure that hearing protectors are worn:

(a) By any employee who is exposed to an 8-hour time-weighted average of 85 dBA or greater; or

(b) By any employee who is exposed to noise above 115 dBA; or

(c) By any employee who is exposed to any impulsive or impact noise measured at or above 140 dB peak using an impulse sound level meter set to either the linear or C-scale.

(3) Employees shall be given the opportunity to select their hearing protectors from at least two different types (i.e. molded, self-molded, custom molded, or ear muffs) of suitable hearing protectors provided by the employer.

(4) The employer shall provide training in the use and care of all hearing protectors provided to employees.

(5) The employer shall ensure proper initial fitting and supervise the correct use of all hearing protectors.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 83-24-013 (Order 83-34), § 296-62-09031, filed 11/30/83; 82-13-045 (Order 82-22), § 296-62-09031, filed 6/11/82; 82-03-023 (Order 82-1), § 296-62-09031, filed 1/15/82.]

**WAC 296-62-09033 Hearing protector attenuation.**

(1) The employer shall evaluate hearing protector attenuation for the specific noise environments in which the protector will be used by one of the methods described in WAC 296-62-09053, Appendix D: Methods for estimating the adequacy of hearing protector attenuation, or by other methods if approved by the director.

(2) Hearing protectors must attenuate employee exposure at least to a time-weighted average of 85 dBA or below.

(3) The adequacy of hearing protector attenuation shall be re-evaluated whenever employee noise exposures increase to the extent that the hearing protectors provided may no longer provide adequate attenuation. The employer shall provide more effective hearing protectors where necessary.

[Title 296 WAC—p 1566]

[Statutory Authority: RCW 49.17.040 and 49.17.050. 83-24-013 (Order 83-34), § 296-62-09033, filed 11/30/83; 82-13-045 (Order 82-22), § 296-62-09033, filed 6/11/82; 82-03-023 (Order 82-1), § 296-62-09033, filed 1/15/82.]

**WAC 296-62-09035 Training program.** (1) The employer shall institute a training program for all employees who are exposed to noise at or above an 8-hour time-weighted average of 85 dBA, and shall ensure employee participation in such program.

(2) The training program shall be repeated annually for each employee included in the hearing conservation program. Information provided in the training program shall be updated to be consistent with changes in protective equipment and work processes.

(3) The employer shall ensure that each employee is informed of the following:

(a) The effects of noise on hearing;

(b) The purpose of hearing protectors, the advantages, disadvantages, and attenuation of various types, and instructions on selection, fitting, use, and care; and

(c) The purpose of audiometric testing, and an explanation of the test procedures.

(d) The right to access to records as specified in WAC 296-62-09041(5).

(4) A written description of the training program instituted shall be maintained by each employer.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 83-24-013 (Order 83-34), § 296-62-09035, filed 11/30/83; 82-03-023 (Order 82-1), § 296-62-09035, filed 1/15/82.]

**WAC 296-62-09037 Access to information and training materials.** (1) The employer shall make available to affected employees or their representatives copies of this standard and shall also post a copy in the workplace.

(2) The employer shall provide to affected employees any informational materials pertaining to this standard that are supplied to the employer by the director.

(3) The employer shall provide, upon request, all materials related to the employer's training and education program pertaining to this standard to the director.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 82-03-023 (Order 82-1), § 296-62-09037, filed 1/15/82.]

**WAC 296-62-09039 Warning signs.** (1) Signs shall be posted at entrances to or on the periphery of all well defined work areas in which employees may be exposed at or above 115 dBA.

(2) Warning signs shall clearly indicate that the area is a high noise area and that hearing protectors are required.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 83-24-013 (Order 83-34), § 296-62-09039, filed 11/30/83; 82-03-023 (Order 82-1), § 296-62-09039, filed 1/15/82.]

**WAC 296-62-09041 Recordkeeping.** (1) Exposure measurements. The employer shall maintain an accurate record of all employee exposure measurements required by this section.

(2) Audiometric tests.

(a) The employer shall retain a legible copy of all employee audiograms obtained pursuant to WAC 296-62-09027.

(b) This record shall include:

- (i) Name and job classification of the employee;
  - (ii) Date of the audiogram;
  - (iii) The examiner's name;
  - (iv) Date of the last acoustic or exhaustive calibration of the audiometer; and
  - (v) Employee's most recent noise exposure assessment.
- (3) Audiometric test rooms. The employer shall maintain accurate records of the measurements of the background sound pressure levels in audiometric test rooms.

(4) Record retention. The employer shall retain records required in this section for at least the following periods:

(a) Noise exposure measurement records shall be retained for two years.

(b) Audiometric test records shall be retained for the duration of the affected employee's employment.

(5) Access to records. All records required by this section shall be provided upon request to employees, former employees, representatives designated by the individual employee, and the director. The provisions of WAC 296-62-05201 through 296-62-05209 and 296-62-05213 through 296-62-05217 apply to access to records under this section.

(6) Transfer of records. If the employer ceases to do business, the employer shall transfer to the successor employer all records required to be maintained by this section, and the successor employer shall retain them for the remainder of the period prescribed in WAC 296-62-09041(4).

[Statutory Authority: RCW 49.17.040 and 49.17.050. 83-24-013 (Order 83-34), § 296-62-09041, filed 11/30/83; 82-03-023 (Order 82-1), § 296-62-09041, filed 1/15/82.]

**WAC 296-62-09043 Appendices.** WAC 296-62-09047, 296-62-09049, 296-62-09051, and 296-62-09053 and 296-62-09055, Appendices A, B, C, D, and E are incorporated as part of this section and the contents of these appendices are mandatory.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 83-24-013 (Order 83-34), § 296-62-09043, filed 11/30/83; 82-03-023 (Order 82-1), § 296-62-09043, filed 1/15/82.]

**WAC 296-62-09045 Effective dates.** (1) WAC 296-62-09015 through 296-62-09053 shall become effective 60 days after filing with the code reviser, unless otherwise noted below.

(2) Monitoring conducted pursuant to WAC 296-62-09019 shall be completed no later than 180 days from the effective date of the standard.

(3) Baseline audiograms required by WAC 296-62-09027 shall be completed no later than December 31, 1982.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 82-03-023 (Order 82-1), § 296-62-09045, filed 1/15/82.]

**WAC 296-62-09047 Appendix A--Audiometric measuring instruments.** (1) In the event that pulsed-tone audiometers are used, they shall have a tone on-time of at least 200 milliseconds.

(2) Self-recording audiometers shall comply with the following requirements:

(a) The chart upon which the audiogram is traced shall have lines at positions corresponding to all multiples of 10 dB hearing level within the intensity range spanned by the audiometer. The lines shall be equally spaced and shall be separated by at least 1/4 inch. Additional increments are optional. The audiogram pen tracings shall not exceed 2 dB in width.

(b) It shall be possible to set the stylus manually at the 10dB increment lines for calibration purposes.

(c) The slewing rate for the audiometer attenuator shall not be more than 6 dB/sec except that an initial slewing rate greater than 6 dB/sec is permitted at the beginning of each new test frequency, but only until the second subject response.

(d) The audiometer shall remain at each required test frequency for 30 seconds ( $\pm 3$  seconds). The audiogram shall be clearly marked at each change of frequency and the actual frequency change of the audiometer shall not deviate from the frequency boundaries marked on the audiogram by more than  $\pm 3$  seconds.

(e) It must be possible at each test frequency to place a horizontal line segment parallel to the time axis on the audiogram, such that the audiometric tracing crosses the line segment at least six times at the test frequency. At each test frequency the threshold shall be the average of the midpoints of the tracing excursions.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 83-24-013 (Order 83-34), § 296-62-09047, filed 11/30/83; 82-03-023 (Order 82-1), § 296-62-09047, filed 1/15/82.]

**WAC 296-62-09049 Appendix B--Audiometric test rooms.** Rooms used for audiometric testing shall not have background sound pressure levels exceeding those in Table B-1 when measured by equipment conforming at least to the Type 2 requirements of American National Standard Specification for Sound Level Meters, S1.4-1971 (R1976), and to the Class II requirements of American National Standard Specification for Octave, Half-Octave, and Third-Octave Band Filter Sets, S1.11-1971 (R1976).

TABLE B-1 - Maximum Allowable Octave-Band Sound Pressure Levels for Audiometric Test Rooms.

Octave-band center frequency (Hz) . . .	500	1000	2000	4000	8000
Sound pressure level (dB) . . . . .	40	40	47	57	62

[Statutory Authority: RCW 49.17.040 and 49.17.050. 82-03-023 (Order 82-1), § 296-62-09049, filed 1/15/82.]

**WAC 296-62-09051 Appendix C--Acoustic calibration of audiometers.** Audiometer calibration shall be checked acoustically, at least annually, according to the procedures described in this Appendix. The equipment

necessary to perform these measurements is a sound level meter, octave-band filter set, and a National Bureau of Standards 9A coupler. In making these measurements, the accuracy of the calibrating equipment shall be sufficient to determine that the audiometer is within the tolerance permitted by American National Standard Specifications for Audiometers, S3.6-1969(R1973).

(1) Sound pressure output check.

(a) Place the earphone coupler over the microphone of the sound level meter and place the earphone on the coupler.

(b) Set the audiometer's hearing threshold level (HTL) dial to 70 dB.

(c) Measure the sound pressure level of the tones at each test frequency from 500 Hz through 6000 Hz for each earphone.

(d) At each frequency the readout on the sound level meter should correspond to the levels in Table C-1 or Table C-2, as appropriate, for the type of earphone, in the column entitled "sound level meter reading."

(2) Linearity check.

(a) With the earphone in place, set the frequency to 1000 Hz and the HTL dial on the audiometer to 70 dB.

(b) Measure the sound levels in the coupler at each 10dB decrement from 70 dB to 10 dB, noting the sound level meter reading at each setting.

(c) For each 10dB decrement on the audiometer the sound level meter should indicate a corresponding 10 dB decrease.

(d) This measurement may be made electrically with a voltmeter connected to the earphone terminals.

(3) Tolerances.

When any of the measured sound levels deviate from the levels in Table C-1 or Table C-2 by  $\pm 3$  dB at any test frequency between 500 and 3000 Hz, 4 dB at 4000 Hz, or 5 dB at 6000 Hz, an exhaustive calibration is required.

Table C-1 - Reference threshold levels for telephonics - TDH-39 earphones

Frequency, Hz	Reference threshold level for TDH-39 earphones, dB	Sound level meter reading, dB
500 .....	11.5	81.5
1000 .....	7	77
2000 .....	9	79
3000 .....	10	80
4000 .....	9.5	79.5
6000 .....	15.5	85.5

Table C-2 - Reference threshold levels for telephonics - TDH-49 Earphones

Frequency, Hz	Reference threshold level for TDH-49 earphones, dB	Sound level meter reading, dB
500 .....	13.5	83.5
1000 .....	7.5	77.5
2000 .....	11	81.0
3000 .....	9.5	79.5
4000 .....	10.5	80.5
6000 .....	13.5	83.5

[Statutory Authority: RCW 49.17.040 and 49.17.050. 83-24-013 (Order 83-34), § 296-62-09051, filed 11/30/83; 82-13-045 (Order 82-22), § 296-62-09051, filed 6/11/82; 82-03-023 (Order 82-1), § 296-62-09051, filed 1/15/82.]

**WAC 296-62-09053 Appendix D--Methods for estimating the adequacy of hearing protector attenuation.**

(1) Hearing protector attenuation must be sufficient to reduce employee exposure to a TWA of 85 dBA.

(2) The most convenient method to use is the noise reduction rating (NRR) developed by the Environmental Protection Agency (EPA). According to EPA regulation, the NRR must be shown on the hearing protector package. The NRR is then related to an individual worker's noise environment in order to assess the adequacy of the attenuation of a given hearing protector. This appendix describes two methods of using the NRR to determine whether a particular hearing protector provides adequate protection within a given exposure environment. Selection between the two procedures is dependent upon the employer's noise measuring instruments.

(3) When using the NRR to assess hearing protector adequacy, one of the following methods must be used:

(a) When using a dosimeter that is capable of making A-weighted measurements:

(i) Convert the A-weighted dose to TWA.

(ii) Subtract 7 dB from the NRR.

(iii) Subtract the remainder from the A-weighted TWA to obtain the estimated A-weighted TWA under the ear protector.

(b) When using a sound level meter set to the A-weighting network:

(i) Obtain the employee's A-weighted TWA.

(ii) Subtract 7 dB from the NRR, and subtract the remainder from the A-weighted TWA to obtain the estimated A-weighted TWA under the ear protector.

(4) Other methods may be utilized if they are at least as effective as the NRR if approved by the director.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 83-24-013 (Order 83-34), § 296-62-09053, filed 11/30/83; 82-03-023 (Order 82-1), § 296-62-09053, filed 1/15/82.]

**WAC 296-62-09055 Appendix E--Noise exposure computation.** (1) Computation of employee noise exposure.

(a) Noise dose is computed using Table E-1 as follows:

(i) When the sound level, L, is constant over the entire work shift, the noise dose, D, in percent, is given by:  $D=100 C/T$  where C is the total length of the work day, in hours, and T is the reference duration corresponding to the measured sound level, L, as given in Table E-1 or by the formula shown as a footnote to that table.

(ii) When the workshift noise exposure is composed of two or more periods of noise at different levels, the total noise dose over the work day is given by:  $D=100(C_1/T_1+C_2/T_2+\dots+C_n/T_n)$ , where  $C_n$  indicates the total time of exposure at a specific noise level, and  $T_n$  indicates the reference duration for that level as given by Table E-1.

(b) The 8-hour time-weighted average sound level (TWA), in decibels, may be computed from the dose, in percent, by means of the formula:  $TWA = 16.61 \log_{10}(D/100)+90$ . For an 8-hour workshift with the noise level constant over the entire shift, the TWA is equal to the measured sound level.

(c) A table relating dose and TWA is given in subsection (2) of this section.

TABLE E-1

A-weighted sound level, L (decibel)	Reference duration, T (hour)
80	32
81	27.9
82	24.3
83	21.1
84	18.4
85	16
86	13.9
87	12.1
88	10.6
89	9.2
90	8
91	7.0
92	6.2
93	5.3
94	4.6
95	4
96	3.5
97	3.0
98	2.6
99	2.3
100	2
101	1.7
102	1.5
103	1.4
104	1.3
105	1
106	0.87
107	0.76

A-weighted sound level, L (decibel)	Reference duration, T (hour)
108	0.66
109	0.57
110	0.5
111	0.44
112	0.38
113	0.33
114	0.29
115	0.25
116	0.22
117	0.19
118	0.16
119	0.14
120	0.125
121	0.11
122	0.095
123	0.082
124	0.072
125	0.063
126	0.054
127	0.047
128	0.041
129	0.036
130	0.031

In the above table the reference duration T, is computed by

$$T = \frac{8}{2(L-90)/5}$$

where L is the measured A-weighted sound level.

(2) Conversion between "dose" and "8-hour time-weighted average" sound level.

(a) Compliance with WAC 296-62-09015 through 296-62-09055 of this regulation is determined by the amount of exposure to noise in the workplace. The amount of such exposure is usually measured with an audiodosimeter which gives a readout in terms of "dose." In order to better understand the requirements of these standards, dosimeter readings can be converted to an "8-hour time-weighted average (TWA) sound level."

(b) In order to convert the reading of a dosimeter into TWA, see Table E-2. This table applies to dosimeters that are set by the manufacturer to calculate dose or percent exposure according to the relationships in Table E-1. So, for example, a dose of 91 percent over an eight-hour day results in a TWA of 89.3 dB, and a dose of 50 percent corresponds to a TWA of 85 dB.

(c) If the dose as read on the dosimeter is less than or greater than the values found in Table E-2, the TWA may be calculated by using the formula:  $TWA = 16.61 \log_{10}(D/100) + 90$  where TWA = 8-hour time-weighted average sound level and D = accumulated dose in percent exposure.

Table E-2 – Conversion from "percent noise exposure" or "dose" to "8-hour time-weighted average sound level" (TWA)

Dose or percent noise exposure	TWA (dBA)
10	73.4
15	76.3
20	78.4
25	80.0
30	81.3
35	82.4
40	83.2
45	84.2
50	85.0
55	85.7
60	86.3
65	86.9
70	87.4
75	87.9
80	88.4
81	88.5
82	88.6
83	88.7
84	88.7
85	88.8
86	88.9
87	89.0
88	89.1
89	89.2
90	89.2
91	89.3
92	89.4
93	89.5
94	89.6
95	89.6
96	89.7
97	89.8
98	89.9
99	89.9
100	90.0
101	90.1
102	90.1
103	90.2
104	90.3
105	90.4
106	90.4
107	90.5
108	90.6
109	90.6
110	90.7
111	90.8
112	90.8
113	90.9
114	90.9
115	91.1
116	91.1
117	91.1
118	91.2
119	91.3
120	91.3

Dose or percent noise exposure	TWA (dBA)
125	91.6
130	91.9
135	92.2
140	92.4
145	92.7
150	92.9
155	93.2
160	93.4
165	93.6
170	93.8
175	94.0
180	94.2
185	94.4
190	94.6
195	94.8
200	95.0
210	95.4
220	95.7
230	96.0
240	96.3
250	96.6
260	96.9
270	97.2
280	97.4
290	97.7
300	97.9
310	98.2
320	98.4
330	98.6
340	98.8
350	99.0
360	99.2
370	99.4
380	99.6
390	99.8
400	100.0
410	100.2
420	100.4
430	100.5
440	100.7
450	100.8
460	101.0
470	101.2
480	101.3
490	101.5
500	101.6
510	101.8
520	101.9
530	102.0
540	102.2
550	102.3
560	102.4
570	102.6
580	102.7
590	102.8
600	102.9
610	103.0
620	103.2
630	103.3



Dose or percent noise exposure	TWA (dBA)
640	103.4
650	103.5
660	103.6
670	103.7
680	103.8
690	103.9
700	104.0
710	104.1
720	104.2
730	104.3
740	104.4
750	104.5
760	104.6
770	104.7
780	104.8
790	104.9
800	105.0
810	105.1
820	105.2
830	105.3
840	105.4
850	105.4
860	105.5
870	105.6
880	105.7
890	105.8
900	105.8
910	105.9
920	106.0
930	106.1
940	106.2
950	106.2
960	106.3
970	106.4
980	106.5
990	106.5
999	106.6

[Statutory Authority: RCW 49.17.040 and 49.17.050. 83-24-013 (Order 83-34), § 296-62-09055, filed 11/30/83.]

## PART L--ATMOSPHERES, VENTILATION, EMERGENCY WASHING

### WAC 296-62-100 Oxygen deficient atmospheres.

(1) Definition. A lack of sufficient oxygen is deemed to exist if the atmosphere at sea level has less than 18% oxygen by volume or has a partial pressure of oxygen of 135 millimeters of mercury (mm. Hg) or less. This may deviate when working at higher elevations and should be determined for an individual location. Factors such as acclimatization, physical conditions of the persons involved, etc., must be considered for such circumstances and conditions.

(2) Entering areas with possible oxygen deficient atmospheres. Workmen entering any area where a lack of sufficient oxygen is probable shall be supplied with and shall use approved equipment (for specific requirements

see applicable provisions of chapter 296-62 WAC) capable of providing safe respirable air, or prior to entry and at all times when workmen are in such areas a sufficient supply of safe, respirable air shall be provided. All workers so exposed shall be under constant observation. If the oxygen content is unknown or may change during occupation, tests shall be required prior to and during occupation of questionable areas.

[Statutory Authority: RCW 49.17.040, 49.17.050, and 49.17.240. 81-16-015 (Order 81-20), § 296-62-100, filed 7/27/81; Order 73-3, § 296-62-100, filed 5/7/73; Order 70-8, § 296-62-100, filed 7/31/70, effective 9/1/70; Rule 10.010, effective 8/1/63.]

### WAC 296-62-110 Ventilation.

[Order 73-3, § 296-62-110, filed 5/7/73; Order 70-8, § 296-62-110, filed 7/31/70, effective 9/1/70; Rules 11.010-11.030, effective 8/1/63.]

**WAC 296-62-11001 Definition.** Ventilation shall mean the provision, circulation or exhausting of air into or from an area or space.

(1) "Local exhaust ventilation" shall mean the mechanical removal of contaminated air from the point where the contaminant is being generated or liberated.

(2) "Dilution ventilation" means inducing and mixing uncontaminated air with contaminated air in such quantities that the resultant mixture in the breathing zone will not exceed the permissible exposure limit (PEL) specified for any contaminant.

(3) "Exhaust ventilation" means the general movement of air out of the area or confined space by mechanical or natural means.

(4) "Tempered makeup air" means air which has been conditioned by changing its heat content to obtain a specific desired temperature.

[Statutory Authority: RCW 49.17.040, 49.17.050, 49.17.240, chapters 42.30 and 43.22 RCW. 80-17-014 (Order 80-20), § 296-62-11001, filed 11/13/80; Order 73-3, § 296-62-11001, filed 5/7/73.]

**WAC 296-62-11003 Ventilation guide.** In addition to those mandatory controls as set forth in WAC 296-62-11015 through 296-62-11021, the Industrial Ventilation Manual of Recommended Practices as compiled and approved by the American Conference of Governmental Industrial Hygienists, applicable ANSI Standard or other National Concensus Standards recommended by the federal government, should be used as a guide for ventilation requirements.

[Order 73-3, § 296-62-11003, filed 5/7/73.]

**WAC 296-62-11005 Adequate system.** Adequate ventilation systems shall be installed as needed to control concentrations of airborne contaminants below applicable threshold limit values.

[Order 73-3, § 296-62-11005, filed 5/7/73.]

**WAC 296-62-11007 Exhaust.** Exhaust from ventilation systems shall discharge in such a manner that the contaminated air being exhausted will not present a health hazard to any workman or reenter buildings in harmful amounts.

[Order 73-3, § 296-62-11007, filed 5/7/73.]

**WAC 296-62-11009 Make-up air quantity.** Make-up air shall be of ample quantity to replace the exhausted air and shall be tempered when necessary.

[Order 73-3, § 296-62-11009, filed 5/7/73.]

**WAC 296-62-11011 Design and operation.** Ventilation systems shall be designed and operated in such a manner that workmen will not be subjected to excessive air velocities.

[Order 73-3, § 296-62-11011, filed 5/7/73.]

**WAC 296-62-11013 Compatibility of systems.** Makeup air systems shall be designed and operated in such a manner that they will not interfere with the effectiveness of the exhaust air system.

[Order 73-3, § 296-62-11013, filed 5/7/73.]

**WAC 296-62-11015 Abrasive blasting. (1) Definitions.**

(a) "Abrasive" means a solid substance used in an abrasive blasting operation.

(b) "Abrasive-blasting respirator" means a continuous flow air-line respirator constructed so that it will cover the wearer's head, neck, and shoulders to protect him from rebounding abrasive.

(c) "Blast cleaning barrel" means a complete enclosure which rotates on an axis, or which has an internal moving tread to tumble the parts, in order to expose various surfaces of the parts to the action of an automatic blast spray.

(d) "Blast cleaning room" means a complete enclosure in which blasting operations are performed and where the operator works inside of the room to operate the blasting nozzle and direct the flow of the abrasive material.

(e) "Blasting cabinet" means an enclosure where the operator stands outside and operates the blasting nozzle through an opening or openings in the enclosure.

(f) "Clean air" means air of such purity that it will not cause harm or discomfort to an individual if it is inhaled for extended periods of time.

(g) "Dust collector" means a device or combination of devices for separating dust from the air handled by an exhaust ventilation system.

(h) "Exhaust ventilation system" means a system for removing contaminated air from a space, comprising two or more of the following elements (i) enclosure or hood, (ii) duct work, (iii) dust collecting equipment, (iv) exhaust, and (v) discharge stack.

(i) "Particulate-filter respirator" means an air purifying respirator, commonly referred to as a dust or a fume respirator, which removes most of the dust or fume from the air passing through the device.

(j) "Respirable dust" means airborne dust in sizes capable of passing through the upper respiratory system to reach the lower lung passages.

(k) "Rotary blast cleaning table" means an enclosure where the pieces to be cleaned are positioned on a rotating table and are passed automatically through a series of blast sprays.

(l) "Abrasive blasting" means the forcible application of an abrasive to a surface by pneumatic pressure, hydraulic pressure, or centrifugal force.

(2) Dust hazards from abrasive blasting.

(a) Abrasives and the surface coatings on the materials blasted are shattered and pulverized during blasting operations and the dust formed will contain particles of respirable size. The composition and toxicity of the dust from these sources shall be considered in making an evaluation of the potential health hazards.

(b) The concentration of respirable dust or fume in the breathing zone of the abrasive-blasting operator or any other worker shall be kept below the levels specified in WAC 296-62-075 through 296-62-07515.

(c) Organic abrasives which are combustible shall be used only in automatic systems. Where flammable or explosive dust mixtures may be present, the construction of the equipment, including the exhaust system and all electric wiring shall conform to the requirements of American National Standard Installation of Blower and Exhaust Systems for Dust, Stock, and Vapor Removal or Conveying, Z33.1-1961 (NFPA 91-1961), and American National Standard Electrical Code, C1-1968 (NFPA 70-1968). The blast nozzle shall be bonded and grounded to prevent the build-up of static charges. Where flammable or explosive dust mixtures may be present, the abrasive blasting enclosure, the ducts, and the dust collector shall be constructed with loose panels or explosion venting areas, located on sides away from any occupied area, to provide for pressure relief in case of explosion, following the principles set forth in the National Fire Protection Association Explosion Venting Guide, NFPA 68-1954.

(3) Blast-cleaning enclosures.

(a) Blast-cleaning enclosures shall be exhaust ventilated in such a way that a continuous inward flow of air will be maintained at all openings in the enclosure, during the blasting operation.

(i) All air inlets and access openings shall be baffled or so arranged that by the combination of inward air flow and baffling the escape of abrasive or dust particles into an adjacent work area will be minimized and visible spurts of dust will not be observed.

(ii) The rate of exhaust shall be sufficient to provide prompt clearance of the dust-laden air within the enclosure after the cessation of blasting.

(iii) Before the enclosure is opened, the blast shall be turned off and the exhaust system shall be run for a sufficient period of time to remove the dusty air within the enclosure.

(iv) Safety glass protected by screening shall be used in observation windows, where hard deep-cutting abrasives are used.

(v) Slit abrasive-resistant baffles shall be installed in multiple sets at all small access openings where dust might escape, and shall be inspected regularly and replaced when needed.

(A) Doors shall be flanged and tight when closed.

(B) Doors on blast-cleaning rooms shall be operable from both inside and outside, except that where there is a small operator access door, the large work access door may be closed or opened from the outside only.

(4) Exhaust ventilation systems.

(a) The construction, installation, inspection, and maintenance of exhaust systems shall conform to the principles and requirements set forth in American National Standard Fundamentals Governing the Design and Operation of Local Exhaust Systems, Z9.2-1960, and ANSI Z33.1-1961.

(i) When dust leaks are noted, repairs shall be made as soon as possible.

(ii) The static pressure drop at the exhaust ducts leading from the equipment shall be checked when the installation is completed and periodically thereafter to assure continued satisfactory operation. Whenever an appreciable change in the pressure drop indicates a partial blockage, the system shall be cleaned and returned to normal operating condition.

(b) In installations where the abrasive is recirculated, the exhaust ventilation system for the blasting enclosure shall not be relied upon for the removal of fines from the spent abrasive instead of an abrasive separator. An abrasive separator shall be provided for the purpose.

(c) The air exhausted from blast-cleaning equipment shall be discharged through dust collecting equipment. Dust collectors shall be set up so that the accumulated dust can be emptied and removed without contaminating other working areas.

(5) Personal protective equipment. See applicable provisions of chapters 296-24 and 296-62 WAC.

(a) Abrasive-blasting respirators shall be worn by all abrasive-blasting operators:

(i) When working inside of blast-cleaning rooms, or

(ii) When using silica sand in manual blasting operations where the nozzle and blast are not physically separated from the operator in an exhaust ventilated enclosure, or

(iii) Where concentrations of toxic dust dispersed by the abrasive-blasting may exceed the limits set in WAC 296-62-075 through 296-62-07515 and the nozzle and blast are not physically separated from the operator in an exhaust-ventilated enclosure.

(b) Particulate filter respirators, commonly referred to as dust-filter respirators, properly fitted, may be used for short, intermittent, or occasional dust exposures such as cleanup, dumping of dust collectors, or unloading shipments of sand at a receiving point, when it is not feasible to control the dust by enclosure, exhaust ventilation, or other means. Respirators used shall be approved for protection against the specific type of dust encountered.

(i) Dust-filter respirators may be used to protect the operator of outside abrasive-blasting operations where nonsilica abrasives are used on materials having low toxicities.

(ii) Dust-filter respirators shall not be used for continuous protection where silica sand is used as the blasting abrasive, or toxic materials are blasted.

(c) A respiratory protection program as defined and described in applicable provisions of chapters 296-24 and 296-62 WAC, shall be established wherever it is necessary to use respiratory protective equipment.

(d) Refer to applicable provisions of chapter 296-24 WAC for operators personal protective equipment.

(6) Operational procedures and general safety. Dust shall not be permitted to accumulate on the floor or on ledges outside of an abrasive-blasting enclosure, and dust spills shall be cleaned up promptly. Aisles and walkways shall be kept clear of steel shot or similar abrasive which may create a slipping hazard.

(7) Scope. This paragraph applies to all operations where an abrasive is forcibly applied to a surface by pneumatic or hydraulic pressure, or by centrifugal force. It does not apply to steam blasting, or steam cleaning, or hydraulic cleaning methods where work is done without the aid of abrasives.

[Statutory Authority: RCW 49.17.040, 49.17.050, and 49.17.240. 81-16-015 (Order 81-20), § 296-62-11015, filed 7/27/81; 80-11-010 (Order 80-14), § 296-62-11015, filed 8/8/80; Order 73-3, § 296-62-11015, filed 5/7/73.]

#### **WAC 296-62-11017 Grinding, polishing, and buffing operations. (1) Definitions.**

(a) "Abrasive cutting-off wheels" means organic-bonded wheels, the thickness of which is not more than one forty-eighth of their diameter for those up to, and including, 20 inches in diameter, and not more than one-sixteenth of their diameter for those larger than 20 inches in diameter, used for a multitude of operations variously known as cutting, cutting off, grooving, slotting, coping, jointing, and the like. The wheels may be "solid" consisting of organic-bonded abrasive material throughout, "steel centered" consisting of a steel disc with a rim of organic-bonded material moulded around the periphery or of the "inserted tooth" type consisting of a steel disc with organic-bonded abrasive teeth or inserts mechanically secured around the periphery.

(b) "Belts" means all power-driven, flexible, coated bands used for grinding, polishing, or buffing purposes.

(c) "Branch pipe" means the part of an exhaust system piping that is connected directly to the hood or enclosure.

(d) "Cradle" means a movable fixture, upon which the part to be ground or polished is placed.

(e) "Disc wheels" means all power-driven rotatable discs faces with abrasive materials, artificial or natural, and used for grinding or polishing on the side of the assembled disc.

(f) "Entry loss" means the loss in static pressure caused by air flowing into a duct or hood. It is usually expressed in inches of water gauge.

(g) "Exhaust system" means a system consisting of branch pipes connected to hoods of enclosures, one or more header pipes, an exhaust fan, means for separating solid contaminants from the air flowing in the system, and a discharge stack to outside.

(h) "Grinding wheels" means all power-driven rotatable grinding or abrasive wheels, except disc wheels as defined in this standard, consisting of abrasive particles

held together by artificial or natural bonds and used for peripheral grinding.

(i) "Header pipe (main pipe)" means a pipe into which one or more branch pipes enter and which connects such branch pipes to the remainder of the exhaust system.

(j) "Hoods and enclosures" means the partial or complete enclosure around the wheel or disc through which air enters an exhaust system during operation.

(k) "Horizontal double-spindle disc grinder" means a grinding machine carrying two power-driven, rotatable, coaxial, horizontal spindles upon the inside ends of which are mounted abrasive disc wheels for grinding two surfaces simultaneously.

(l) "Horizontal single-spindle disc grinder" means a grinding machine carrying an abrasive disc wheel upon one or both ends of a power-driven, rotatable single horizontal spindle.

(m) "Polishing and buffing wheels" means all power-driven rotatable wheels composed all or in part of textile fabrics, wood, felt, leather, paper, and may be coated with abrasives on the periphery of the wheel for purposes of polishing, buffing, and light grinding.

(n) "Portable grinder" means any power-driven rotatable grinding, polishing, or buffing wheel mounted in such manner that it may be manually manipulated.

(o) "Scratch brush wheels" means all power-driven rotatable wheels made from wire or bristles, and used for scratch cleaning and brushing purposes.

(p) "Swing-frame grinder" means any power-driven rotatable grinding, polishing, or buffing wheel mounted in such a manner that the wheel with its supporting framework can be manipulated over stationary objects.

(q) "Velocity pressure (vp)" means the kinetic pressure in the direction of flow necessary to cause a fluid at rest to flow at a given velocity. It is usually expressed in inches of water gauge.

(r) "Vertical spindle disc grinder" means a grinding machine having a vertical, rotatable power-driven spindle carrying a horizontal abrasive disc wheel.

(2) Application.

(a) Every establishment performing dry grinding, dry polishing, or buffing shall provide suitable hood or enclosures that are connected to exhaust systems.

(b) Such exhaust systems shall be operated continuously whenever such operations are carried on, and be capable of preventing contaminants from entering the breathing zone.

(3) Hood and branch pipe requirements.

(a) Hoods connected to exhaust systems shall be used, and such hoods shall be designed, located, and placed so that the dust or dirt particles shall fall or be projected into the hoods in the direction of the air flow. No wheels, discs, straps, or belts shall be operated in such manner and in such direction as to cause the dust and dirt particles to be thrown into the operator's breathing zone.

(b) Grinding wheels on floor stands, pedestals, benches, and special-purpose grinding machines and abrasive cutting-off wheels shall have not less than the

minimum exhaust volumes shown in Table 8 with a recommended minimum duct velocity of 4,500 feet per minute in the branch and 3,500 feet per minute in the main. The entry losses from all hoods except the vertical-spindle disc grinder hood, shall equal 0.65 velocity pressure for a straight takeoff and 0.45 velocity pressure for a tapered takeoff. The entry loss for the vertical-spindle disc grinder hood is shown in Figure 3. (See Fig. 3 following this section.)

TABLE 8  
GRINDING AND ABRASIVE CUTTING-OFF WHEELS

Wheel diameter (inches)	Wheel width (inches)	Minimum exhaust volume (feet <sup>3</sup> /min.)
To 9	1 1/2	220
Over 9 to 16	2	390
Over 16 to 19	3	500
Over 19 to 24	4	610
Over 24 to 30	5	880
Over 30 to 36	6	1,200

For any wheel wider than wheel diameter shown in Table 8, increase the exhaust volume by the ratio of the new width to the width shown.

Example:

$$\frac{4.5}{4} \times 610 = 686 \text{ (rounded to 690).}$$

(c) Scratch-brush wheels and all buffing and polishing wheels mounted on floor stands, pedestals, benches, or special-purpose machines shall have not less than the minimum exhaust volume shown in Table 9.

TABLE 9  
BUFFING AND POLISHING WHEELS

Wheel diameter (inches)	Wheel width (inches)	Minimum exhaust volume (feet <sup>3</sup> /min.)
To 9	2	300
Over 9 to 16	3	500
Over 16 to 19	4	610
Over 19 to 24	5	740
Over 24 to 30	6	1,040
Over 30 to 36	6	1,200

(d) Grinding wheels or discs for horizontal single-spindle disc grinders shall be hooded to collect the dust or dirt generated by the grinding operation and the hoods shall be connected to branch pipes having exhaust volumes as shown in Table 10.

TABLE 10  
HORIZONTAL SINGLE-SPINDLE DISC GRINDER

Disc diameter (inches)	Exhaust volume (feet <sup>3</sup> /min.)
Up to 12	220
Over 12 to 19	390
Over 19 to 30	610
Over 30 to 36	880

(e) Grinding wheels or discs for horizontal double-spindle disc grinders shall have a hood enclosing the grinding chamber and the hood shall be connected to one or more branch pipes having exhaust volumes as shown in Table 11.

TABLE 11  
HORIZONTAL DOUBLE-SPINDLE  
DISC GRINDER

Disc diameter (inches)	Exhaust volume (feet <sup>3</sup> /min.)
Up to 19	610
Over 19 to 25	880
Over 25 to 30	1,200
Over 30 to 53	1,770
Over 53 to 72	6,280

(f) Grinding wheels or discs for vertical single-spindle disc grinders shall be encircled with hoods to remove the dust generated in the operation. The hoods shall be connected to one or more branch pipes having exhaust volumes as shown in Table 12.

TABLE 12  
VERTICAL SPINDLE DISC GRINDER

Disc diameter (inches)	One-half or more of disc covered		Disc not covered	
	Num- ber <sup>1</sup>	Exhaust feet <sup>3</sup> /min.	Num- ber <sup>1</sup>	Exhaust feet <sup>3</sup> /min.
Up to 20	1	500	2	780
Over 20 to 30	2	780	2	1,480
Over 30 to 53	2	1,770	4	3,530
Over 53 to 72	2	3,140	5	6,010

<sup>1</sup>Number of exhaust outlets around periphery of hood, or equal distribution provided by other means.

(g) Grinding and polishing belts shall be provided with hoods to remove dust and dirt generated in the operations and the hoods shall be connected to branch pipes having exhaust volumes as shown in Table 13.

TABLE 13  
GRINDING AND POLISHING BELTS

Belts width (inches)	Exhaust volume (feet <sup>3</sup> /min.)
Up to 3	220
Over 3 to 5	300
Over 5 to 7	390
Over 7 to 9	500
Over 9 to 11	610
Over 11 to 13	740

(h) Cradles and swing-frame grinders. Where cradles are used for handling the parts to be ground, polished, or buffed, requiring large partial enclosures to house the complete operation, a minimum average air velocity of 150 feet per minute shall be maintained over the entire opening of the enclosure. Swing-frame grinders shall also be exhausted in the same manner as provided for cradles. (See Fig. 5 following this section.)

(i) Where the work is outside the hood, air volumes must be increased as shown in American Standard Fundamentals Governing the Design and Operation of Local Exhaust Systems, Z9.2-1960 (Section 4, Exhaust Hoods).

(4) Exhaust systems.

(a) Exhaust systems for grinding, polishing, and buffing operations should be designed in accordance with American Standard Fundamentals Governing the Design and Operation of Local Exhaust Systems, Z9.2-1960.

(b) Exhaust systems for grinding, polishing, and buffing operations shall be tested in the manner described in American Standard Fundamentals Governing the Design and Operation of Local Exhaust Systems, Z9.2-1960.

(c) All exhaust systems shall be provided with suitable dust collectors.

(5) Hood and enclosure design.

(a)(i) It is the dual function of grinding and abrasive cutting-off wheel hoods to protect the operator from the hazards of bursting wheels as well as to provide a means for the removal of dust and dirt generated. All hoods shall be not less in structural strength than specified in the American National Standard Code for the Use, Care, and Protection of Abrasive Wheels, B7.1-1970.

(ii) For grinding machines for which no standard hoods are available, hoods meeting the requirements of (5)(a)(i) above shall be developed and so located so as to comply with the requirements of this section.

(b) Exhaust hoods for floor stands, pedestals, and bench grinders shall be designed in accordance with Figure 4. (See Fig. 4 following this section.) The adjustable tongue shown in the figure shall be kept in working order and shall be adjusted within one-fourth inch of the wheel periphery at all times.

(c) Swing-frame grinders shall be provided with exhaust booths as indicated in Figure 5. (See Fig. 5 following this section.)

(d) Portable grinding operations, whenever the nature of the work permits, shall be conducted within a partial enclosure. The opening in the enclosure shall be no

larger than is actually required in the operation and an average face air velocity of not less than 200 feet per minute shall be maintained.

(e) Hoods for polishing and buffing and scratch-brush wheels shall be constructed to conform as closely to Figure 6 as the nature of the work will permit. (See Fig. 6 following this section.)

(f) Cradle grinding and polishing operations shall be performed within a partial enclosure similar to Figure 7. (See Fig. 7 following this section.) The operator shall be positioned outside the working face of the opening of the enclosure. The face opening of the enclosure should not be any greater in area than that actually required for the performance of the operation and the average air velocity into the working face of the enclosure shall not be less than 150 feet per minute.

(g) Hoods for horizontal single-spindle disc grinders shall be constructed to conform as closely as possible to the hood shown in Figure 8. (See Fig. 8 following this section.) It is essential that there be a space between the back of the wheel and the hood, and a space around the periphery of the wheel of at least 1 inch in order to permit the suction to act around the wheel periphery. The opening on the side of the disc shall be no larger than is

required for the grinding operation, but must never be less than twice the area of the branch outlet.

(h) Horizontal double-spindle disc grinders shall have a hood encircling the wheels and grinding chamber similar to that illustrated in Figure 9. (See Fig. 9 following this section.) The openings for passing the work into the grinding chamber should be kept as small as possible, but must never be less than twice the area of the branch outlets.

(i) Vertical-spindle disc grinders shall be encircled with a hood so constructed that the heavy dust is drawn off a surface of the disc and the lighter dust exhausted through a continuous slot at the top of the hood as shown in Figure 3. (See Fig. 3 following this section.)

(j) Grinding and polishing belt hoods shall be constructed as close to the operation as possible. The hood should extend almost to the belts, and 1-inch wide openings should be provided on either side. Figure 10 shows a typical hood for a belt operation. (See Fig. 10 following this section.)

(6) Scope. This paragraph, prescribes the use of exhaust hood enclosures and systems in removing dust, dirt, fumes, and gases generated through the grinding, polishing, or buffing of ferrous and nonferrous metals.

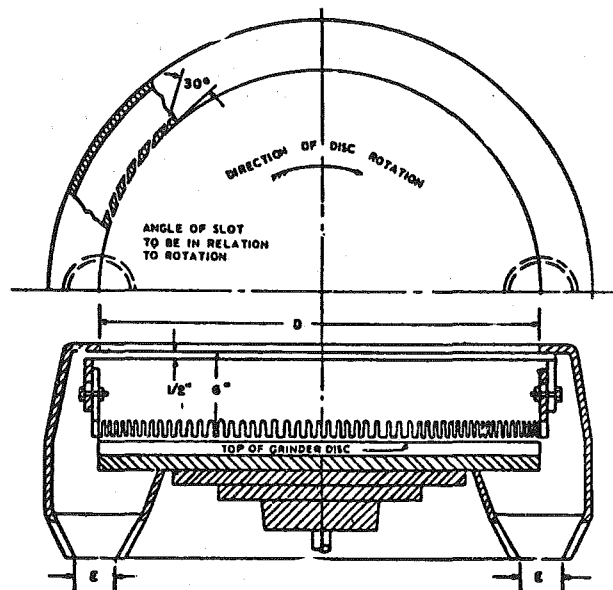


Fig. 3  
Vertical Spindle Disc Grinder Exhaust  
Hood and Branch Pipe Connections

Dia D. Inches		Exhaust E		Volume Exhausted at 4,500 ft/min ft <sup>3</sup> /min	Note
Min.	Max	No. Pipes	Dia		
Over 20	20	1	4 1/2	500	When one-half or more of the disc can be hooded, use exhaust ducts as shown at the left.
Over 30	30	2	4	780	
Over 53	72	2	6	1,770	
Over 53	72	2	8	3,140	
Over 20	20	2	4	780	When no hood can be used over disc, use exhaust ducts as shown at left.
Over 30	30	2	5 1/2	1,480	
Over 53	53	4	6	3,530	
Over 53	72	5	7	6,010	

Entry loss = 1.0 slot velocity pressure + 0.5 branch velocity pressure  
 Minimum slot velocity = 2,000 ft/min - 1/2-inch slot width

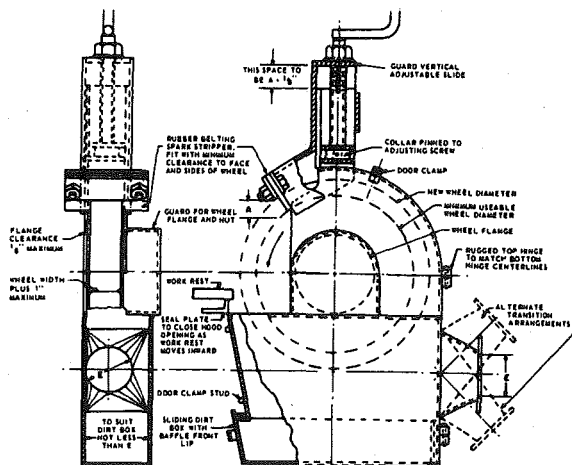


Fig. 4  
Standard Grinder Hood

Wheel Dimension			Exhaust Outlet Inches	Volume of Air at 4,500 ft/min
Diameter, Inches		Width, Inches		
Min = d	Max = D	Max	E	
Over 9	9	1 1/2	3	220
Over 16	16	2	4	390
Over 19	19	3	4 1/2	500
Over 24	24	4	5	610
Over 30	30	5	6	880
Over 30	36	6	7	1,200

Entry loss = 0.45 velocity pressure for tapered takeoff  
 0.65 velocity pressure for straight takeoff



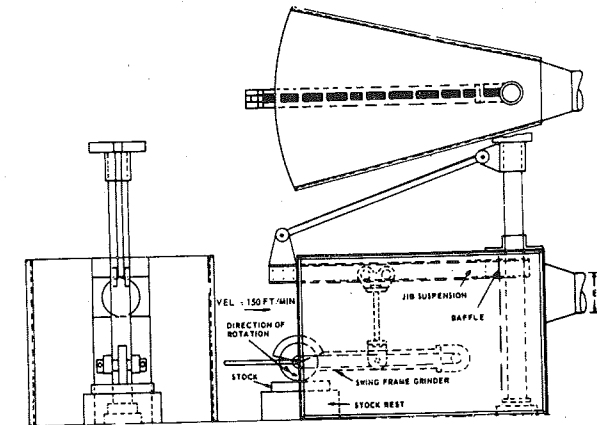


Fig. 5

A method of Applying an Exhaust Enclosure to Swing-Frame Grinders

Note: Baffle to reduce front opening as much as possible

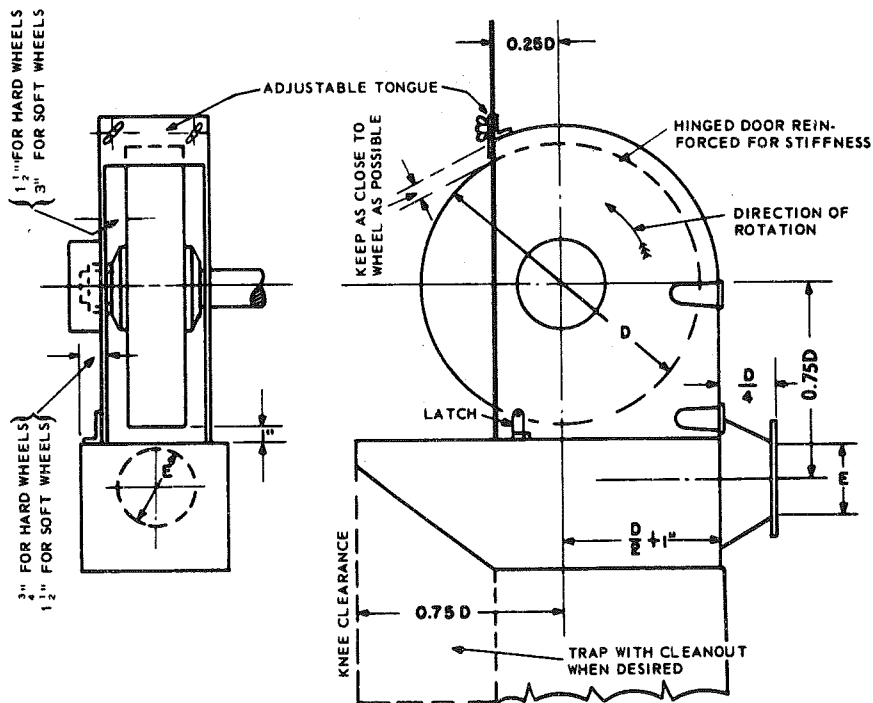


Fig. 6

Standard Buffing and Polishing Hood

Wheel Dimension, Inches			Exhaust Outlet Inches	Volume of Air at 4,500 ft/min
Diameter		Width		
Min = d	Max = D	Max	E	
Over 9	9	2	3 1/2	300
	16	3	4	500

Wheel Dimension, Inches			Exhaust Outlet Inches	Volume of Air at 4,500 ft/min
Diameter		Width		
Min = d	Max = D	Max	E	
Over 16	19	4	5	610
Over 19	24	5	5 1/2	740
Over 24	30	6	6 1/2	1,040
Over 30	36	6	7	1,200

Entry loss = 0.45 velocity pressure for tapered takeoff  
 0.65 velocity pressure for straight takeoff

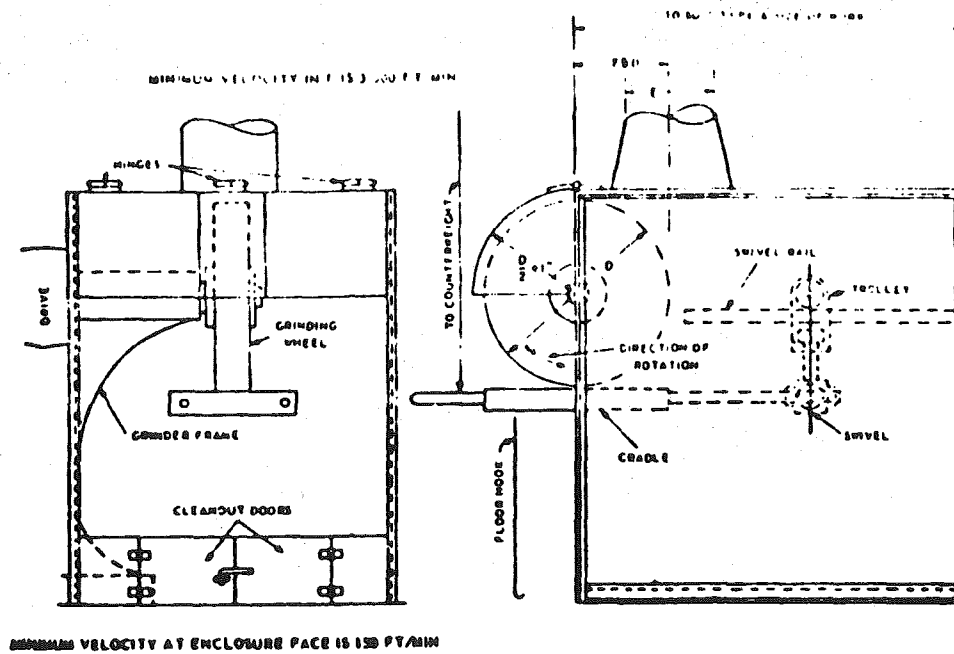


Fig. 7

Cradle Polishing or Grinding Enclosure

Entry loss = 0.45 velocity pressure for tapered takeoff

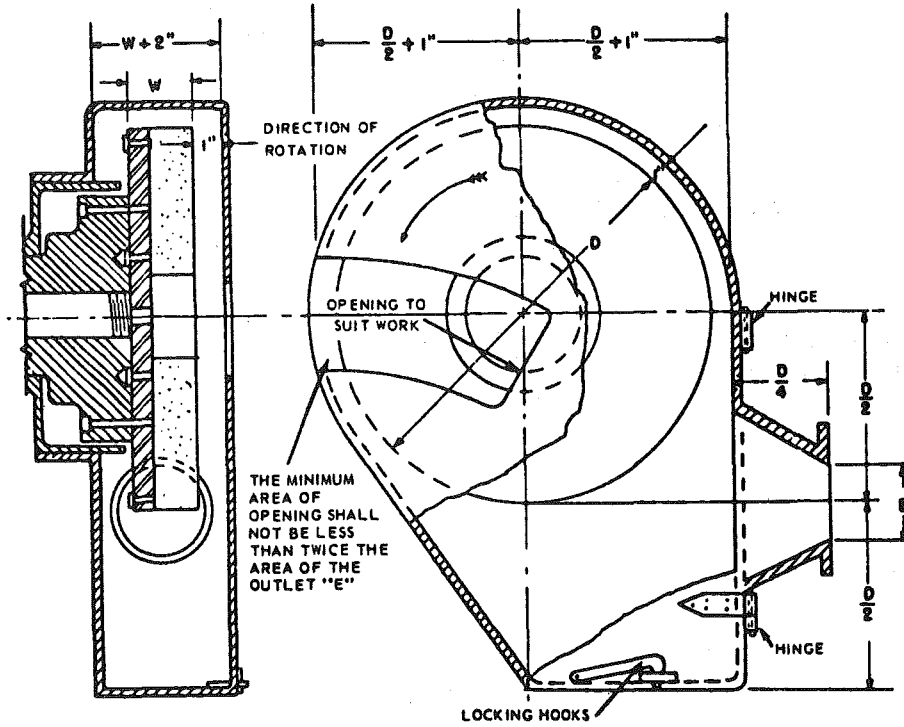


Fig. 8  
Horizontal Single-Spindle Disc Grinder  
Exhaust Hood and Branch Pipe Connection

Dia. D. Inches		Exhaust E	Volume Exhausted at 4,500 ft/min ft <sup>3</sup> /min
Min	Max	Dia. Inches	
	12	3	220
Over 12	19	4	390
Over 19	30	5	610
Over 30	36	6	880

Note: If grinding wheels are used for disc grinding purposes, hoods must conform to structural strength and materials as described in 9.1.  
Entry loss = 0.45 velocity pressure for tapered takeoff

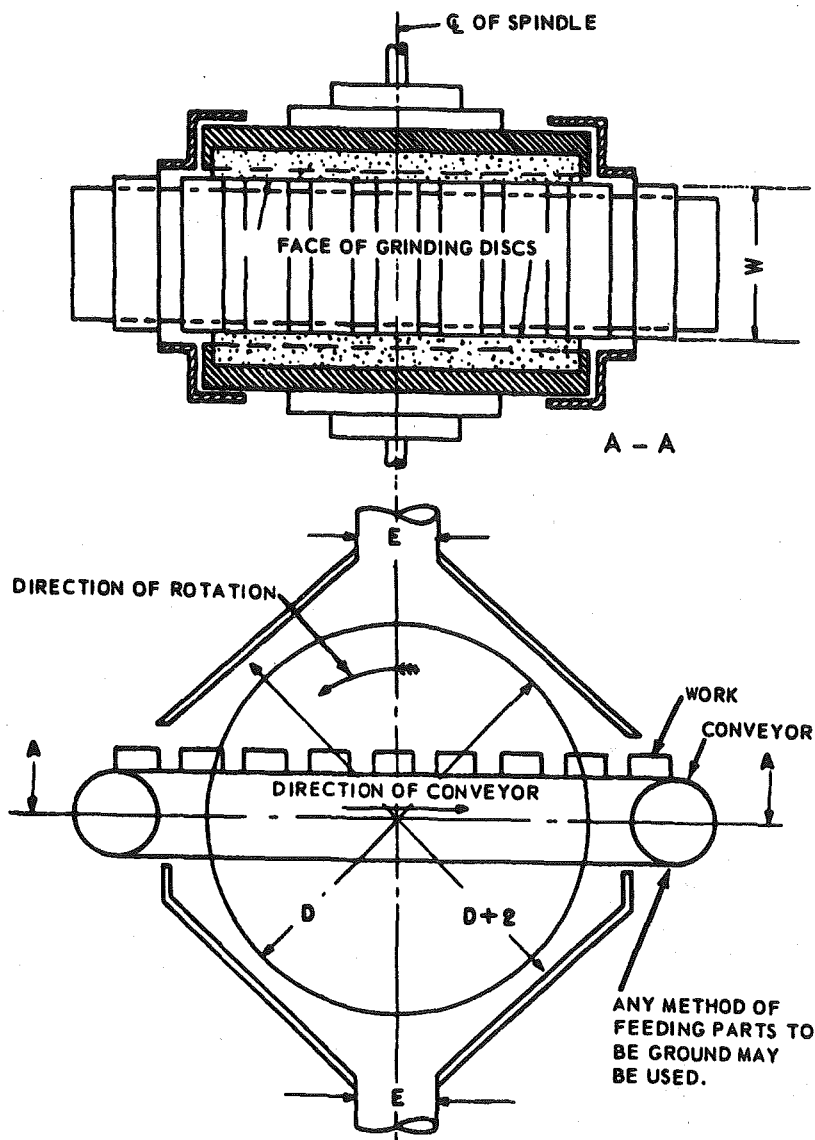


Fig. 9  
Horizontal Double-Spindle Disc Grinder  
Exhaust Hood and Branch Pipe Connection

Disc Dia. Inches		Exhaust E		Volume Exhausted at 4,500 ft/min ft <sup>3</sup> /min	Note
Min.	Max	No. Pipes	Dia		
	19	1	5	610	When width "W" permits, exhaust ducts should be as near heaviest grinding as possible.
Over 19	25	1	6	880	
Over 25	30	1	7	1,200	
Over 30	53	2	6	1,770	
Over 53	72	4	8	6,280	

Entry loss = 0.45 velocity pressure for tapered takeoff

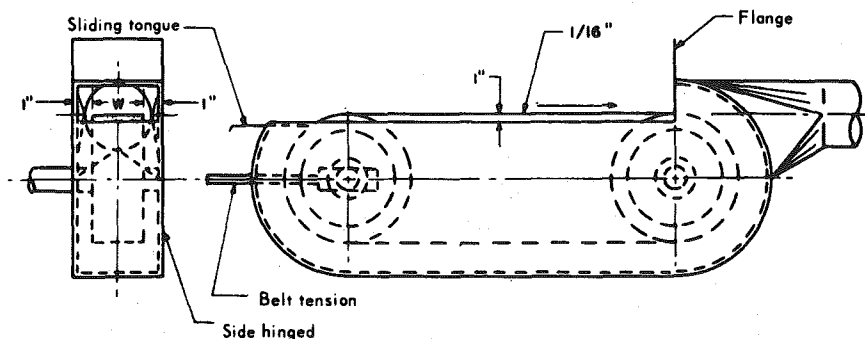


Fig. 10

A Typical Hood for a Belt Operation

Belt Width w. Inches	Exhaust Volume. ft <sup>3</sup> /min
up to 3	220
3 to 5	300
5 to 7	390
7 to 9	500
9 to 11	610
11 to 13	740

Minimum duct velocity = 4.500 ft./min. branch.  
3.500 ft./min. main.

Entry loss = 0.45 velocity pressure for tapered takeoff  
0.65 velocity pressure for straight takeoff

[Order 73-3, § 296-62-11017 and diagrams, filed 5/7/73.]

#### WAC 296-62-11019 Spray-finishing operations. (1) Definitions.

(a) "Spray-finishing operations" means employment of methods wherein organic or inorganic materials are utilized in dispersed form from deposit on surfaces to be coated, treated or cleaned. Such methods of deposit may involve either automatic, manual, or electrostatic deposition but do not include metal spraying or metallizing, dipping, flow coating, roller coating, tumbling, centrifuging, or spray washing and degreasing as conducted in self-contained washing and degreasing machines or systems.

(b) "Spray booth" spray booths are defined and described in WAC 296-24-370 through 296-24-37007. (See sections 103, 104, and 105 of the Standard for Spray Finishing Using Flammable and Combustible Materials, NFPA No. 33-1969.)

(c) "Spray room" means a room in which spray-finishing operations not conducted in a spray booth are performed separately from other areas.

(d) "Minimum maintained velocity" means the velocity of air movement which must be maintained in order to meet minimum specified requirements for health and safety.

(2) Location and application. Spray booths or spray rooms are to be used to enclose or confine all operations.

Spray-finishing operations shall be located as provided in sections 201 through 206 of the Standard for Spray Finishing Using Flammable and Combustible Materials, NFPA No. 33-1969.

(3) Design and construction of spray booths.

(a) Spray booths shall be designed and constructed in accordance with WAC 296-24-370 through 296-24-37007 (see sections 301-304 and 306-310 of the Standard for Spray Finishing Using Flammable and Combustible Materials, NFPA No. 33-1969), for general construction specifications.

Note: For a more detailed discussion of fundamentals relating to this subject, see ANSI Z9.2-1960.

(i) Lights, motors, electrical equipment and other sources of ignition shall conform to the requirements of WAC 296-24-370. (See section 310 and chapter 4 of the Standard for Spray Finishing Using Flammable and Combustible Materials, NFPA No. 33-1969.)

(ii) In no case shall combustible material be used in the construction of a spray booth and supply or exhaust duct connected to it.

(b) Unobstructed walkways shall not be less than 6 1/2 feet high and shall be maintained clear of obstruction from any work location in the booth to a booth exit or open booth front. In booths where the open front is the only exit, such exits shall be not less than 3 feet wide. In booths having multiple exits, such exits shall not be less than 2 feet wide, provided that the maximum distance from the work location to the exit is 25 feet or less. Where booth exits are provided with doors, such doors shall open outward from the booth.

(c) Baffles, distribution plates, and dry-type overspray collectors shall conform to the requirements of WAC 296-24-370. (See sections 304 and 305 of the Standard for Spray Finishing Using Flammable and Combustible Materials, NFPA No. 33-1969.)

(i) Overspray filters shall be installed and maintained in accordance with the requirements of WAC 296-24-370, (See section 305 of the Standard for Spray Finishing Using Flammable and Combustible Materials, NFPA No. 33-1969), and shall only be in a location easily accessible for inspection, cleaning, or replacement.

(ii) Where effective means, independent of the overspray filters are installed which will result in design air distribution across the booth cross section, it is permissible to operate the booth without the filters in place.

(d)(i) For wet or water-wash spray booths, the water-chamber enclosure, within which intimate contact of contaminated air and cleaning water or other cleaning medium is maintained, if made of steel, shall be 18 gauge or heavier and adequately protected against corrosion.

(ii) Chambers may include scrubber spray nozzles, headers, troughs, or other devices. Chambers shall be provided with adequate means for creating and maintaining scrubbing action for removal of particulate matter from the exhaust air stream.

(e) Collecting tanks shall be of welded steel construction or other suitable noncombustible material. If pits are used as collecting tanks, they shall be concrete, masonry, or other material having similar properties.

(i) Tanks shall be provided with weirs, skimmer plates, or screens to prevent sludge and floating paint from entering the pump suction box. Means for automatically maintaining the proper water level shall also be provided. Fresh water inlets shall not be submerged. They shall terminate at least one pipe diameter above the safety overflow level of the tank.

(ii) Tanks shall be so constructed as to discourage accumulation of hazardous deposits.

(f) Pump manifolds, risers, and headers shall be adequately sized to insure sufficient water flow to provide efficient operation of the water chamber.

#### (4) Design and construction of spray rooms.

(a) Spray rooms, including floors, shall be constructed of masonry, concrete, or other noncombustible material.

(b) Spray rooms shall have noncombustible fire doors and shutters.

(c) Spray rooms shall be adequately ventilated so that the atmosphere in the breathing zone of the operator shall be maintained in accordance with the requirements of (6)(b) of this section.

(d) Spray rooms used for production spray-finishing operations shall conform to the requirements of spray booths.

#### (5) Ventilation.

(a) Ventilation shall be provided in accordance with provisions of WAC 296-24-370, (See chapter 5 of the Standard for Spray Finishing Using Flammable or Combustible Materials, NFPA No. 33-1969), and in accordance with the following:

(i) Where a fan plenum is used to equalize or control the distribution of exhaust air movement through the booth, it shall be of sufficient strength or rigidity to withstand the differential air pressure or other superficially imposed loads for which the equipment is designed and also to facilitate cleaning. Construction specifications shall be at least equivalent to those of (5)(c) of this section.

(ii) All fan ratings shall be in accordance with Air Moving and Conditioning Association Standard Test Code for Testing Air Moving Devices, Bulletin 210, April 1962.

(b) Inlet or supply ductwork used to transport makeup air to spray booths or surrounding areas shall be constructed of noncombustible materials.

(i) If negative pressure exists within inlet ductwork, all seams and joints shall be sealed if there is a possibility of infiltration of harmful quantities of noxious gases, fumes, or mists from areas through which ductwork passes.

(ii) Inlet ductwork shall be sized in accordance with volume flow requirements and provide design air requirements at the spray booth.

(iii) Inlet ductwork shall be so supported throughout its length to sustain at least its own weight plus any negative pressure which is exerted upon it under normal operating conditions.

(c) Ducts shall be so constructed as to provide structural strength and stability at least equivalent to sheet steel of not less than the following thickness:

DIAMETER OR GREATER DIMENSION	(U.S. gauge)
Up to 8 inches inclusive . . . . .	No. 24
Over 8 inches to 18 inches inclusive . . . . .	No. 22
Over 18 inches to 30 inches inclusive . . . . .	No. 20
Over 30 inches . . . . .	No. 18

(i) Exhaust ductwork shall be adequately supported throughout its length to sustain its weight plus any normal accumulation in interior during normal operating conditions and any negative pressure exerted upon it.

(ii) Exhaust ductwork shall be sized in accordance with good design practice which shall include consideration of fan capacity, length of duct, number of turns and elbows, variation in size, volume, and character of materials being exhausted. See American National Standard Z9.2-1960 for further details and explanation concerning elements of design.

(iii) Longitudinal joints in sheet steel ductwork shall be either lock-seamed, riveted, or welded. For other than steel construction, equivalent securing of joints shall be provided.

(iv) Circumferential joints in ductwork shall be substantially fastened together and lapped in the direction of airflow. At least every fourth joint shall be provided with connecting flanges, bolted together or of equivalent fastening security.

(v) Inspection or clean-out doors shall be provided for every 9 to 12 feet of running length for ducts up to 12 inches in diameter, but the distance between clean-out doors may be greater for larger pipes. (See 8.3.21 of American National Standard Z9.1-1960.) A clean-out door or doors shall be provided for servicing the fan, and where necessary, a drain shall be provided.

(vi) Where ductwork passes through a combustible roof or wall, the roof or wall shall be protected at the point of penetration by open space or fire-resistive material between the duct and the roof or wall. When ducts pass through fire-walls, they shall be provided with automatic fire dampers on both sides of the wall, except that three-eighth-inch steel plates may be used in lieu

of automatic fire dampers for ducts not exceeding 18 inches in diameter.

(vii) Ductwork used for ventilating any process covered in this standard shall not be connected to ducts ventilating any other process or any chimney or flue used for conveying any products of combustion.

(6) Velocity and air flow requirements.

(a) Except where a spray booth has an adequate air replacement system, the velocity of air into all openings of a spray booth shall be not less than that specified in Table 14 for the operating conditions specified. An adequate air replacement system is one which introduces replacement air upstream or above the object being sprayed and is so designed that the velocity of air in the booth cross section is not less than that specified in Table 14 when measured upstream or above the object being sprayed.

**TABLE 14**  
MINIMUM MAINTAINED VELOCITIES  
INTO SPRAY BOOTHS

Operating conditions for object completely inside booth	Crossdraft f.p.m.	Airflow Velocities, f.p.m.	
		Design	Range
Electrostatic and automatic airless operation contained in booth without operator.	Negligible . . . . .	50 large booth	50-75
		100 small booth	75-125
Air-operated guns, manual or automatic	Up to 50 . . . . .	100 large booth	75-125
		150 small booth	125-175
Air-operated guns, manual or automatic	Up to 100 . . . . .	150 large booth	125-175
		200 small booth	150-250

Notes:

- (1) Attention is invited to the fact that the effectiveness of the spray booth is dependent upon the relationship of the depth of the booth to its height and width.
- (2) Crossdrafts can be eliminated through proper design and such design should be sought. Crossdrafts in excess of 100 fpm (feet per minute) should not be permitted.
- (3) Excessive air pressures result in loss of both efficiency and material waste in addition to creating a backlash that may carry overspray and fumes into adjacent work areas.
- (4) Booths should be designed with velocity shown in the column headed "Design." However, booths operating with velocities shown in the column headed "Range" are in compliance with this standard.

(b) In addition to the requirements in (6)(a) of this section the total air volume exhausted through a spray booth shall be such as to dilute solvent vapor to at least 25 percent of the lower explosive limit of the solvent being sprayed. An example of the method of calculating this volume is given below.

Example: To determine the lower explosive limits of the most common solvents used in spray finishing, see Table 15. Column 1 gives the number of cubic feet of vapor per gallon of solvent and column 2 gives the lower explosive limit (LEL) in percentage by volume of air. Note that the quantity of solvent will be diminished by the quantity of solids and nonflammable contained in the finish.

To determine the volume of air in cubic feet necessary to dilute the vapor from 1 gallon of solvent to 25 percent of the lower explosive limit, apply the following formula:

$$\text{Dilution volume required per gallon of solvent} = \frac{4 (100 - \text{LEL}) (\text{cubic feet of vapor per gallon})}{\text{LEL}}$$

Using toluene as the solvent.

(1) LEL of toluene from Table 15, column 2, is 1.4 percent.

(2) Cubic feet of vapor per gallon from Table 15, column 1, is 30.4 cubic feet per gallon.

(3) Dilution volume required =

$$\frac{4 (100 - 1.4) 30.4}{1.4} = 8,564 \text{ cubic feet.}$$

(4) To convert to cubic feet per minute of required ventilation, multiply the dilution volume required per gallon of solvent by the number of gallons of solvent evaporated per minute.

**TABLE 15**  
LOWER EXPLOSIVE LIMIT OF SOME  
COMMONLY USED SOLVENTS

Solvent	Cubic feet of vapor per gallon of liquid at 70°F.	Lower explosive limit in percent of air at 70°F.
		Column 1    Column 2
Acetone . . . . .	44.0	2.6
Amyl Acetate (iso) . . . . .	21.6	1.0 <sup>1</sup>
Amyl Alcohol (n) . . . . .	29.6	1.2
Amyl Alcohol (iso) . . . . .	29.6	1.2
Benzene . . . . .	36.8	1.4 <sup>1</sup>
Butyl Acetate (n) . . . . .	24.8	1.7
Butyl Alcohol (n) . . . . .	35.2	1.4
Butyl Cellosolve . . . . .	24.8	1.1
Cellosolve . . . . .	33.6	1.8
Cellosolve Acetate . . . . .	23.2	1.7
Cyclohexanone . . . . .	31.2	1.1 <sup>1</sup>
1,1 Dichloroethylene . . . . .	42.4	5.6
1,2 Dichloroethylene . . . . .	42.4	9.7
Ethyl Acetate . . . . .	32.8	2.5
Ethyl Alcohol . . . . .	55.2	4.3
Ethyl Lactate . . . . .	28.0	1.5 <sup>1</sup>
Methyl Acetate . . . . .	40.0	3.1



**TABLE 15**  
LOWER EXPLOSIVE LIMIT OF SOME  
COMMONLY USED SOLVENTS

Solvent	Cubic feet of vapor per gallon of liquid at 70°F.	Lower explosive limit in percent by volume of air at 70°F.
	Column 1	Column 2
Methyl Alcohol	80.8	7.3
Methyl Cellosolve	40.8	2.5
Methyl Ethyl Ketone	36.0	1.8
Methyl n-Propyl Ketone	30.4	1.5
Naphtha (VM&P) (76° Naphtha)	22.4	0.9
Naphtha (100° Flash) Safety Solvent-Stoddard Solvent	23.2	1.1
Propyl Acetate (n)	27.2	2.0
Propyl Acetate (iso)	28.0	1.8
Propyl Alcohol (n)	44.8	2.1
Propyl Alcohol (iso)	44.0	2.0
Toluene	30.4	1.4
Turpentine	20.8	0.8
Xylene (o)	26.4	1.0

<sup>1</sup>At 212°F.

(c)(i) When an operator must position himself in a booth downstream of the object being sprayed, an air supplied respirator or other type of respirator listed in the applicable provisions of chapter 296-62 WAC for the material being sprayed should be used by the operator.

(ii) Where downdraft booths are provided with doors, such doors shall be closed when spray painting.

(7) Make-up air.

(a) Clean fresh air, free of contamination from adjacent industrial exhaust systems, chimneys, stacks, or vents, shall be supplied to a spray booth or room in quantities equal to the volume of air exhausted through the spray booth.

(b) Where a spray booth or room receives make-up air through self-closing doors, dampers, or louvers, they shall be fully open at all times when the booth or room is in use for spraying. The velocity of air through such doors, dampers, or louvers shall not exceed 200 feet per minute. If the fan characteristics are such that the required air flow through the booth will be provided, higher velocities through the doors, dampers, or louvers may be used.

(c)(i) Where the air supply to a spray booth or room is filtered, the fan static pressure shall be calculated on the assumption that the filters are dirty to the extent that they require cleaning or replacement.

(ii) The rating of filters shall be governed by test data supplied by the manufacturer of the filter. A pressure gauge shall be installed to show the pressure drop across the filters. This gauge shall be marked to show the pressure drop at which the filters require cleaning or replacement. Filters shall be replaced or cleaned whenever the pressure drop across them becomes excessive or whenever the air flow through the face of the booth falls below that specified in Table 14.

(d)(i) Means of heating make-up air to any spray booth or room, before or at the time spraying is normally performed, shall be provided in all places where the outdoor temperature may be expected to remain below 55° F. for appreciable periods of time during the operation of the booth except where adequate and safe means of radiant heating for all operating personnel affected is provided. The replacement air during the heating seasons shall be maintained at not less than 65° F. at the point of entry into the spray booth or spray room. When otherwise unheated make-up air would be at a temperature of more than 10° F. below room temperature, its temperature shall be regulated as provided in section 3.6 of ANSI Z9.2-1960.

(ii) As an alternative to an air replacement system complying with the preceding section, general heating of the building in which the spray room or booth is located may be employed provided that all occupied parts of the building are maintained at not less than 65° F. when the exhaust system is in operation or the general heating system supplemented by other sources of heat may be employed to meet this requirement.

(iii) No means of heating make-up air shall be located in a spray booth.

(iv) Where make-up air is heated by coal or oil, the products of combustion shall not be allowed to mix with the make-up air, and the products of combustion shall be conducted outside the building through a flue terminating at a point remote from all points where make-up air enters the building.

(v) Where make-up air is heated by gas, and the products of combustion are not mixed with the make-up air but are conducted through an independent flue to a point outside the building remote from all points where make-up air enters the building, it is not necessary to comply with (7)(d)(vi) of this section.

(vi) Where make-up air to any manually operated spray booth or room is heated by gas and the products of combustion are allowed to mix with the supply air, the following precautions must be taken:

(A) The gas must have a distinctive and strong enough odor to warn workmen in a spray booth or room of its presence if in an unburned state in the make-up air.

(B) The maximum rate of gas supply to the make-up air heater burners must not exceed that which would yield in excess of 200 p.p.m. (parts per million) of carbon monoxide or 2,000 p.p.m. of total combustible gases in the mixture if the unburned gas upon the occurrence of flame failure were mixed with all of the make-up air supplied.

(C) A fan must be provided to deliver the mixture of heated air and products of combustion from the plenum chamber housing the gas burners to the spray booth or room.

(8) Scope. Spray booths or spray rooms are to be used to enclose or confine all spray finishing operations covered by this paragraph. This paragraph does not apply to the spraying of the exteriors of buildings, fixed tanks, or similar structures, nor to small portable spraying apparatus not used repeatedly in the same location.

[Statutory Authority: RCW 49.17.040, 49.17.050, and 49.17.240. 81-16-015 (Order 81-20), § 296-62-11019, filed 7/27/81; Order 73-3, § 296-62-11019, filed 5/7/73.]

**WAC 296-62-11021 Open surface tanks. (1) General.**

(a) This section applies to all operations involving the immersion of materials in liquids, or in the vapors of such liquids, for the purpose of cleaning or altering the surface or adding to or imparting a finish thereto or changing the character of the materials, and their subsequent removal from the liquid or vapor, draining, and drying. These operations include washing, electroplating, anodizing, pickling, quenching, dyeing, dipping, tanning, dressing, bleaching, degreasing, alkaline cleaning, stripping, rinsing, digesting, and other similar operations.

(b) Except where specific construction specifications are prescribed in this section, hoods, ducts, elbows, fans, blowers, and all other exhaust system parts, components, and supports thereof shall be so constructed as to meet conditions of service and to facilitate maintenance and shall conform in construction to the specifications contained in American National Standard Fundamentals Governing the Design and Operation of Local Exhaust Systems, Z9.2-1960.

(2) Classification of open-surface tank operations.

(a) Open-surface tank operations shall be classified into 16 classes, numbered A-1 to D-4, inclusive.

(b) Determination of class. Class is determined by two factors, hazard potential designated by a letter from A to D, inclusive, and rate of gas, vapor, or mist evolution designated by a number from 1 to 4, inclusive (for example, B.3).

(c) Hazard potential is an index, on a scale of from A to D, inclusive, of the severity of the hazard associated with the substance contained in the tank because of the toxic, flammable, or explosive nature of the vapor, gas, or mist produced therefrom. The toxic hazard is determined from the concentration, measured in parts by volume of a gas or vapor, per million parts by volume of contaminated air (ppm), or in milligrams of mist per cubic meter of air ( $\text{mg}/\text{m}^3$ ), below which ill effects are unlikely to occur to the exposed worker. The concentrations shall be those in WAC 296-62-075 through 296-62-07515.

(d) The relative fire or explosion hazard is measured in degrees Fahrenheit in terms of the closed-cup flash point of the substance in the tank. Detailed information on the prevention of fire hazards in dip tanks may be

found in Dip Tanks Containing Flammable or Combustible Liquids, NFPA No. 34-1966, National Fire Protection Association. Where the tank contains a mixture of liquids, other than organic solvents, whose effects are additive, the hygienic standard of the most toxic component (for example, the one having the lowest ppm or  $\text{mg}/\text{m}^3$ ) shall be used, except where such substance constitutes an insignificantly small fraction of the mixture. For mixtures of organic solvents, their combined effect, rather than that of either individually, shall determine the hazard potential. In the absence of information to the contrary, the effects shall be considered as additive. If the sum of the ratios of the airborne concentration of that contaminant exceeds unity, the toxic concentration shall be considered to have been exceeded. (See Note A of (2)(e) of this section.)

(e) Hazard potential shall be determined from Table 16, with the value indicating greater hazard being used. When the hazardous material may be either a vapor with a permissible exposure limit in ppm or a mist with a TLV in  $\text{mg}/\text{m}^3$ , the TLV indicating the greater hazard shall be used (for example, A takes precedence over B or C; B over C; C over D).

Note A:

$$\frac{c_1}{\text{PEL}} + \frac{c_2}{\text{PEL}} + \frac{c_3}{\text{PEL}} + \dots + \frac{c_N}{\text{PEL}} > 1$$

where:

c = Concentration measured at the operation in ppm.

**TABLE 16**  
DETERMINATION OF HAZARD POTENTIAL

Hazard potential	Toxicity Group		
	Gas or vapor (ppm)	Mist ( $\text{mg}/\text{m}^3$ )	Flash point (in degrees F.)
A.....	0 - 10	0 - 0.1	....
B.....	11 - 100	0.11 - 1.0	Under 100
C.....	101 - 500	1.1 - 10	100-200
D.....	Over 500	Over 10	Over 200

(f) Rate of gas, vapor, or mist evolution is a numerical index, on a scale of from 1 to 4, inclusive, both of the relative capacity of the tank to produce gas, vapor, or mist and of the relative energy with which it is projected or carried upwards from the tank. Rate is evaluated in terms of;

(i) The temperature of the liquid in the tank in degrees Fahrenheit;

(ii) The number of degrees Fahrenheit that this temperature is below the boiling point of the liquid in degrees Fahrenheit;

(iii) The relative evaporation of the liquid in still air at room temperature in an arbitrary scale—fast, medium, slow, or nil; and

(iv) The extent that the tank gases or produces mist in an arbitrary scale—high, medium, low, and nil. (See Table 17, Note 2.) Gassing depends upon electrochemical or mechanical processes, the effects of

which have to be individually evaluated for each installation (see Table 17, Note 3).

(g) Rate of evolution shall be determined from Table 17. When evaporation and gassing yield different rates, the lowest numerical value shall be used.

TABLE 17  
DETERMINATION OF RATE OF GAS,  
VAPOR, OR MIST EVOLUTION<sup>1</sup>

Rate	Liquid temperature, °F	Degrees below boiling point	evaporation <sup>2</sup>	Relative Gassing <sup>3</sup>
1	Over 200	0-20	Fast	High
2	150-200	21-50	Medium	Medium
3	94-149	51-100	Slow	Low
4	Under 94	Over 100	Nil	Nil

Note 1. In certain classes of equipment, specifically vapor degreasers, an internal condenser or vapor level thermostat is used to prevent the vapor from leaving the tank during normal operations. In such cases, rate of vapor evolution from the tank into the workroom is not dependent upon the factors listed in the table, but rather upon abnormalities of operating procedure, such as carry out of vapors from excessively fast action, dragout of liquid by entrainment in parts, contamination of solvent by water and other materials, or improper heat balance. When operating procedure is excellent, effective rate of evolution may be taken as 4. When operating procedures are average, the effective rate of evolution may be taken as 3. When operation is poor, a rate of 2 or 1 is indicated, depending upon observed conditions.

Note 2. Relative evaporation rate is determined according to the methods described by A. K. Doolittle in *Industrial and Engineering Chemistry*, vol. 27, p. 1169, (3) where time for 100 percent evaporation is as follows: Fast: 0-3 hours; Medium: 3-12 hours; Slow: 12-50 hours; Nil: more than 50 hours.

Note 3. Gassing means the formation by chemical or electrochemical action of minute bubbles of gas under the surface of the liquid in the tank and is generally limited to aqueous solutions.

(3) Ventilation. Where ventilation is used to control potential exposures to workers as defined in (2)(c) of this section, it shall be adequate to reduce the concentration of the air contaminant to the degree that a hazard to the worker does not exist. Methods of ventilation are discussed in *American National Standard Fundamentals Governing the Design and Operation of Local Exhaust Systems*, Z9.2-1960.

(4) Control requirements.

(a) Control velocities shall conform to Table 18 in all cases where the flow of air past the breathing or working zone of the operator and into the hoods is undisturbed by local environmental conditions, such as open windows, wall fans, unit heaters, or moving machinery.

(b) All tanks exhausted by means of hoods which;

(i) Project over the entire tank;

(ii) Are fixed in position in such a location that the head of the workman, in all his normal operating positions while working at the tank, is in front of all hood openings; and

(iii) Are completely enclosed on at least two sides, shall be considered to be exhausted through an enclosing hood.

(iv) The quantity of air in cubic feet per minute necessary to be exhausted through an enclosing hood shall be not less than the product of the control velocity times the net area of all openings in the enclosure through which air can flow into the hood.

TABLE 18  
CONTROL VELOCITIES IN FEET PER MINUTE (F.P.M.) FOR  
UNDISTURBED LOCATIONS

Class (See Sub-paragraph (2) and Tables 16 and 17)	Enclosing hood (See Subparagraph (4)(ii))		Lateral exhaust <sup>1</sup> (See Sub-Paragraph (4)(iii))	Canopy hood <sup>2</sup> (See Sub-paragraph (4)(iv))	
	One open side	Two open sides		Three open sides	Four open sides
A-1 and A-2	100	150	150	Do not use	Do not use
A-3 (Note <sup>2</sup> ), B-1, B-2, and C-1	75	100	100	125	175
B-3, C-2, and D-1 (Note <sup>3</sup> )	65	90	75	100	150
A-4 (Note <sup>2</sup> ), C-3, and D-2 (Note <sup>3</sup> )	50	75	50	75	125
B-4, C-4, D-3 (Note <sup>3</sup> ), and D-4	General room ventilation required.				

<sup>1</sup>See Table 19 for computation of ventilation rate.

<sup>2</sup>Do not use canopy hood for Hazard Potential A processes.

<sup>3</sup>Where complete control of hot water is desired, design as next highest class.

(c) All tanks exhausted by means of hoods which do not project over the entire tank, and in which the direction of air movement into the hood or hoods is substantially horizontal, shall be considered to be laterally exhausted. The quantity of air in cubic feet per minute necessary to be laterally exhausted per square foot of tank area in order to maintain the required control velocity shall be determined from Table 19 for all variations in ratio of tank width (W) to tank length (L). The total quantity of air in cubic feet per minute required to be exhausted per tank shall be not less than the product of the area of tank surface times the cubic feet per minute per square foot of tank area, determined from Table 19.

(i) For lateral exhaust hoods over 42 inches wide, or where it is desirable to reduce the amount of air removed from the workroom, air supply slots or orifices shall be provided along the side or the center of the tank

opposite from the exhaust slots. The design of such systems shall meet the following criteria:

(A) The supply air volume plus the entrained air shall not exceed 50 percent of the exhaust volume.

(B) The velocity of the supply airstream as it reaches the effective control area of the exhaust slot shall be less than the effective velocity over the exhaust slot area.

(C) The vertical height of the receiving exhaust hood, including any baffle, shall not be less than one-quarter the width of the tank.

(D) The supply airstream shall not be allowed to impinge on obstructions between it and the exhaust slot in such a manner as to significantly interfere with the performance of the exhaust hood.

TABLE 19

MINIMUM VENTILATION RATE IN CUBIC FEET OF AIR PER MINUTE PER SQUARE FOOT OF TANK AREA FOR LATERAL EXHAUST

Required minimum control velocity, f.p.m. (from Table)	C.f.m. per sq. ft. to maintain required minimum velocities at following ratios (tank width (W)/tank length (L)). <sup>1,3</sup>				
	0.0-0.09	0.1-0.24	0.25-0.49	0.5-0.99	1.0-2.0

Hood along one side or two parallel sides of tank when one hood is against a wall or baffle.<sup>2</sup>  
Also for a manifold along tank centerline.<sup>3</sup>

50	50	60	75	90	100
75	75	90	110	130	150
100	100	125	150	175	200
150	150	190	225	260	300

Hood along one side or two parallel sides of free standing tank not against wall or baffle.

50	75	90	100	110	125
75	110	130	150	170	190
100	150	175	200	225	250
150	225	260	300	340	375

<sup>1</sup>It is not practicable to ventilate across the long dimension of a tank whose ratio W/L exceeds 2.0.

It is understandable to do so when W/L exceeds 1.0. For circular tanks with lateral exhaust along up the circumference use W/L = 1.0 for over one-half the circumference use W/L = 0.5.

<sup>2</sup>Baffle is a vertical plate the same length as the tank, and with the top of the plate as high as the tank is wide. If the exhaust hood is on the side of a tank against a building wall or close to it, it is perfectly baffled.

<sup>3</sup>Use W/L as tank width in computing when manifold is along centerline, or when hoods are used on two parallel sides of a tank.

Tank Width (W) means the effective width over which the hood must pull air to operate (for example, where the hood face is not back from the edge of the tank, this set back must be added in measuring tank width). The surface area of tanks can frequently be reduced and better control obtained (particularly on conveyorized systems) by using covers extending from the upper edges of the slots toward the center of the tank.

(E) Since most failure of push-pull systems result from excessive supply air volumes and pressures, methods of measuring and adjusting the supply air shall be provided. When satisfactory control has been achieved,

the adjustable features of the hood shall be fixed so that they will not be altered.

(d) All tanks exhausted by means of hoods which project over the entire tank, and which do not conform to the definition of enclosing hoods, shall be considered to be overhead canopy hoods. The quantity of air in cubic feet per minute necessary to be exhausted through a canopy hood shall be not less than the product of the control velocity times the net area of all openings between the bottom edges of the hood and the top edges of the tank.

(e) The rate of vapor evolution (including steam or products of combustion) from the process shall be estimated. If the rate of vapor evolution is equal to or greater than 10 percent of the calculated exhaust volume required, the exhaust volume shall be increased in equal amount.

(5) Spray cleaning and degreasing. Wherever spraying or other mechanical means are used to disperse a liquid above an open-surface tank, control must be provided for the airborne spray. Such operations shall be enclosed as completely as possible. The inward air velocity into the enclosure shall be sufficient to prevent the discharge of spray into the workroom. Mechanical baffles may be used to help prevent the discharge of spray. Spray painting operations are covered in WAC 296-62-11019.

(6) Control means other than ventilation. Tank covers, foams, beads, chips, or other materials floating on the tank surface so as to confine gases, mists, or vapors to the area under the cover or to the foam, bead, or chip layer; or surface tension depressive agents added to the liquid in the tank to minimize mist formation, or any combination thereof, may all be used as gas, mist, or vapor control means for open-surface tank operations, provided that they effectively reduce the concentrations of hazardous materials in the vicinity of the worker below the limits set in accordance with (2) of this section.

(7) System design.

(a) The equipment for exhausting air shall have sufficient capacity to produce the flow of air required in each of the hoods and openings of the system.

(b) The capacity required in (7)(a) of this section shall be obtained when the airflow producing equipment is operating against the following pressure losses, the sum of which is the static pressure:

(i) Entrance losses into the hood.

(ii) Resistance to airflow in branch pipe including bends and transformations.

(iii) Entrance loss into the main pipe.

(iv) Resistance to airflow in main pipe including bends and transformations.

(v) Resistance of mechanical equipment; that is, filters, washers, condensers, absorbers, etc., plus their entrance and exit losses.

(vi) Resistance in outlet duct and discharge stack.

(c) Two or more operations shall not be connected to the same exhaust system where either one or the combination of the substances removed may constitute a fire, explosion, or chemical reaction hazard in the duct system. Traps or other devices shall be provided to insure

that condensate in ducts does not drain back into any tank.

(d) The exhaust system, consisting of hoods, ducts, air mover, and discharge outlet shall be designed in accordance with American National Standard Fundamentals Governing the Design and Operation of Local Exhaust Systems, Z9.2-1960, or the manual, Industrial Ventilation, published by the American Conference of Governmental Industrial Hygienists. Airflow and pressure loss data provided by the manufacturer of any air cleaning device shall be included in the design calculations.

(8) Operation.

(a) The required airflow shall be maintained at all times during which gas, mist, or vapor is emitted from the tank, and at all times the tank, the draining, or the drying area is in operation or use. When the system is first installed, the airflow from each hood shall be measured by means of a pitot traverse in the exhaust duct and corrective action taken if the flow is less than that required. When the proper flow is obtained, the hood static pressure shall be measured and recorded. At intervals of not more than 3 months operation, or after a prolonged shutdown period, the hoods and duct system shall be inspected for evidence of corrosion or damage. In any case where the airflow is found to be less than required, it shall be increased to the required value. (Information on airflow and static pressure measurement and calculations may be found in American National Standard Fundamentals Governing the Design and Operation of Local Exhaust Systems, Z9.2-1960, or in the manual, Industrial Ventilation, published by the American Conference of Governmental Industrial Hygienists.)

(b) The exhaust system shall discharge to the outer air in such a manner that the possibility of its effluent entering any building is at a minimum. Recirculation shall only be through a device for contaminant removal which will prevent the creation of a health hazard in the room or area to which the air is recirculated.

(c) A volume of outside air in the range of 90 percent to 110 percent of the exhaust volume shall be provided to each room having exhaust hoods. The outside air supply shall enter the workroom in such a manner as not to be detrimental to any exhaust hood. The airflow of the makeup air system shall be measured on installation. Periodically, thereafter, the airflow should be remeasured, and corrective action shall be taken when the airflow is below that required. The makeup air shall be uncontaminated.

(9) Personal protection.

(a) All employees working in and around open surface tank operations must be instructed as to the hazards of their respective jobs, and in the personal protection and first aid procedures applicable to these hazards.

(b) All persons required to work in such a manner that their feet may become wet shall be provided with rubber or other impervious boots or shoes, rubbers, or wooden-soled shoes sufficient to keep feet dry.

(c) All persons required to handle work wet with a liquid other than water shall be provided with gloves impervious to such a liquid and of a length sufficient to prevent entrance of liquid into the tops of the gloves.

The interior of gloves shall be kept free from corrosive or irritating contaminants.

(d) All persons required to work in such a manner that their clothing may become wet shall be provided with such aprons, coats, jackets, sleeves, or other garments made of rubber, or of other materials impervious to liquids other than water, as are required to keep their clothing dry. Aprons shall extend well below the top of boots to prevent liquid splashing into the boots. Provision of dry, clean, cotton clothing along with rubber shoes or short boots and an apron impervious to liquids other than water shall be considered a satisfactory substitute where small parts are cleaned, plated, or acid dipped in open tanks and rapid work is required.

(e) Whenever there is a danger of splashing, for example, when additions are made manually to the tanks, or when acids and chemicals are removed from the tanks, the employees so engaged shall be required to wear either tight-fitting chemical goggles or an effective face shield. (See WAC 296-24-078.)

(f) When, during emergencies as described in (11)(e) of this section, workers must be in areas where concentrations of air contaminants are greater than the limit set by (2)(c) of this section, or oxygen concentrations are less than 18 percent, they shall be required to wear respirators adequate to reduce their exposure to a level below these limits, or to provide adequate oxygen. Such respirators shall also be provided in marked, quickly accessible storage compartments built for the purpose, when there exists the possibility of accidental release of hazardous concentrations of air contaminants. Respirators shall meet the applicable provisions of chapter 296-62 WAC and shall be selected by a competent industrial hygienist or other technically qualified source. Respirators shall be used in accordance with the applicable provisions of chapter 296-62 WAC, and persons who may require them shall be trained in their use.

(g) Near each tank containing a liquid which may burn, irritate, or otherwise be harmful to the skin if splashed upon the worker's body, there shall be a supply of clean cold water. The water pipe (carrying a pressure not exceeding 25 pounds) shall be provided with a quick opening valve and at least 48 inches of hose not smaller than three-fourths inch, so that no time may be lost in washing off liquids from the skin or clothing. Alternatively, deluge showers and eye flushes shall be provided in cases where harmful chemicals may be splashed on parts of the body.

(h) Operators with sores, burns, or other skin lesions requiring medical treatment shall not be allowed to work at their regular operations until so authorized by a physician. Any small skin abrasions, cuts, rash, or open sores which are found or reported shall be treated by a properly designated person so that chance of exposures to the chemicals are removed. Workers exposed to chromic acids shall have a periodic examination made of the nostrils and other parts of the body, to detect incipient ulceration.

(i) Sufficient washing facilities, including soap, individual towels, and hot water, shall be provided for all persons required to use or handle any liquids which may

burn, irritate, or otherwise be harmful to the skin, on the basis of at least one basin (or its equivalent) with a hot water faucet for every 10 employees. (See WAC 296-24-12009.)

(j) Locker space or equivalent clothing storage facilities shall be provided to prevent contamination of street clothing.

(k) First aid facilities specific to the hazards of the operations conducted shall be readily available.

(10) Special precautions for cyanide. Dikes or other arrangements shall be provided to prevent the possibility of intermixing of cyanide and acid in the event of tank rupture.

(11) Inspection, maintenance, and installation.

(a) Floors and platforms around tanks shall be prevented from becoming slippery both by original type of construction and by frequent flushing. They shall be firm, sound, and of the design and construction to minimize the possibility of tripping.

(b) Before cleaning the interior of any tank, the contents shall be drained off, and the cleanout doors shall be opened where provided. All pockets in tanks or pits, where it is possible for hazardous vapors to collect, shall be ventilated and cleared of such vapors.

(c) Tanks which have been drained to permit employees to enter for the purposes of cleaning, inspection, or maintenance may contain atmospheres which are hazardous to life or health, through the presence of flammable or toxic air contaminants, or through the absence of sufficient oxygen. Before employees shall be permitted to enter any such tank, appropriate tests of the atmosphere shall be made to determine if the limits set by (2)(c) of this section are exceeded, or if the oxygen concentration is less than 18 percent.

(d) If the tests made in accordance with (11)(c) of this section indicate that the atmosphere in the tank is unsafe, before any employee is permitted to enter the tank, the tank shall be ventilated until the hazardous atmosphere is removed, and ventilation shall be continued so as to prevent the occurrence of a hazardous atmosphere as long as an employee is in the tank.

(e) If, in emergencies, such as rescue work, it is necessary to enter a tank which may contain a hazardous atmosphere, suitable respirators, such as self-contained breathing apparatus; hose mask with blower, if there is a possibility of oxygen deficiency; or a gas mask, selected and operated in accordance with (9)(f) of this section, shall be used. If a contaminant in the tank can cause dermatitis, or be absorbed through the skin, the employee entering the tank shall also wear protective clothing. At least one trained standby employee, with suitable respirator, shall be present in the nearest uncontaminated area. The standby employee must be able to communicate with the employee in the tank and be well able to haul him out of the tank with a lifeline if necessary.

(f) Maintenance work requiring welding or open flame, where toxic metal fumes such as cadmium, chromium, or lead may be evolved, shall be done only with sufficient local exhaust ventilation to prevent the creation of a health hazard, or be done with respirators selected and used in accordance with (9)(f) of this section.

Welding, or the use of open flames near any solvent cleaning equipment shall be permitted only after such equipment has first been thoroughly cleared of solvents and vapors.

(12) Vapor degreasing tanks.

(a) In any vapor degreasing tank equipped with a condenser and vapor level thermostat, the condenser or thermostat shall keep the level of vapors below the top edge of the tank by a distance at least equal to one-half the tank width, or at least 36 inches, whichever is shorter.

(b) Where gas is used as a fuel for heating vapor degreasing tanks, the combustion chamber shall be of tight construction, except for such openings as the exhaust flue, and those that are necessary for supplying air for combustion. Flues shall be of corrosion-resistant construction and shall extend to the outer air. If mechanical exhaust is used on this flue, a draft diverter shall be used. Special precautions must be taken to prevent solvent fumes from entering the combustion air of this or any other heater when chlorinated or fluorinated hydrocarbon solvents (for example, trichloroethylene; Freon) are used.

(c) Heating elements shall be so designed and maintained that their surface temperature will not cause the solvent or mixture to decompose, break down, or be converted into an excessive quantity of vapor.

(d) Tanks or machines of more than 4 square feet of vapor area, used for solvent cleaning or vapor degreasing, shall be equipped with suitable cleanout or sludge doors located near the bottom of each tank or still. These doors shall be so designed and gasketed that there will be no leakage of solvent when they are closed.

(13) Scope.

(a) This paragraph applies to all operations involving the immersion of materials in liquids, or in the vapors of such liquids, for the purpose of cleaning or altering their surfaces, or adding or imparting a finish thereto, or changing the character of the materials, and their subsequent removal from the liquids or vapors, draining, and drying. Such operations include washing, electroplating, anodizing, pickling, quenching, dyeing, dipping, tanning, dressing, bleaching, degreasing, alkaline cleaning, stripping, rinsing, digesting, and other similar operations, but do not include molten materials handling operations, or surface coating operations.

(b) "Molten materials handling operations" means all operations, other than welding, burning, and soldering operations, involving the use, melting, smelting, or pouring of metals, alloys, salts, or other similar substances in the molten state. Such operations also include heat treating baths, descaling baths, die casting stereotyping, galvanizing, tinning, and similar operations.

(c) "Surface coating operations" means all operations involving the application of protective, decorative, adhesive, or strengthening coating or impregnation to one or more surfaces, or into the interstices of any object or material, by means of spraying, spreading, flowing, brushing, roll coating, pouring, cementing, or similar means; and any subsequent draining or drying operations, excluding open-tank operations.

[Statutory Authority: RCW 49.17.040, 49.17.050, and 49.17.240. 81-16-015 (Order 81-20), § 296-62-11021, filed 7/27/81; 80-11-010 (Order 80-14), § 296-62-11021, filed 8/8/80; Order 73-3, § 296-62-11021, filed 5/7/73.]

**WAC 296-62-130 Emergency washing facilities. (1) Definitions.**

(a) "Emergency washing facilities" means emergency showers, eyewashes, eye/face washes, or other similar units.

(b) "Emergency shower" means a unit that enables a user to have water cascading over the entire body. It shall deliver a minimum of 113.6 liters (30 gallons) per minute of water.

(c) "Eye/face wash" means a device used to irrigate and flush both the face and eyes. It shall deliver not less than 11.4 liters (3 gallons) per minute of water for at least fifteen minutes.

(d) "Eyewash" means a device to irrigate and flush the eyes. It shall deliver not less than 1.5 liters (0.4 gallons) per minute for at least fifteen minutes.

(e) "Personal eyewash" means a portable, supplementary eyewash that supports plumbed units, self-contained units, or both, by delivering immediate flushing for less than fifteen minutes.

(f) "Contact chemical agents" are defined in WAC 296-62-07003.

**(2) Facilities required.**

(a) Emergency washing facilities shall be readily available in the immediate work area for workers who may be exposed to harmful concentrations of contact chemical agents. To be readily available, emergency washing facilities shall require no more than ten seconds to reach. They should be within a travel distance no greater than 15.25 meters (50 feet).

(b) Personal eyewash equipment may be used to supplement the requirement for emergency washing facilities, however, in no event shall it be used as a substitute. Such units shall deliver potable water or other medically approved eye flushing solution.

(c) All emergency washing facilities, including personal eyewash equipment, shall be periodically inspected to ensure that they function correctly and that the quality and quantity of water is satisfactory for emergency washing purposes.

(3) All emergency washing facilities using nonpotable water shall have signs stating water is nonpotable.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 85-10-004 (Order 85-09), § 296-62-130, filed 4/19/85; Order 73-3, § 296-62-130, filed 5/7/73; Order 70-8, § 296-62-130, filed 7/31/70, effective 9/1/70; Rule 13.010, effective 8/1/63.]

**PART M—CONFINED SPACES**

**WAC 296-62-145 Confined spaces.**

[Order 73-3, § 296-62-145 reference section, filed 5/7/73.]

**WAC 296-62-14501 Definitions.** (1) "Confined space" means any space having a limited means of egress which is subject to the accumulation of toxic or flammable contaminants or an oxygen deficient atmosphere. Confined spaces include but are not limited to

storage tanks, process vessels, bins, boilers, ventilation or exhaust ducts, sewers, underground utility vaults, tunnels, pipelines and open top spaces more than 4 feet in depth, such as pits, tubes, vaults and vessels.

(2) Toxic atmospheres are atmospheres having concentrations of airborne chemicals in excess of permissible exposure limits as defined in WAC 296-62-075 through 296-62-07517.

(3) Chemical contact agents are defined in WAC 296-62-07003.

(4) Oxygen deficient atmospheres are deemed to exist if the atmosphere at sea level has less than 18% oxygen by volume or has a partial pressure of 135 millimeters of mercury or less. This may deviate when working at higher altitudes and should be determined for an individual location. Factors such as acclimatization, physical condition of persons involved, etc., must be considered for such circumstances and conditions.

(5) Flammable atmospheres are atmospheres in excess of 20% of the lower explosive limit. These are usually toxic as well as flammable.

[Statutory Authority: RCW 49.17.040, 49.17.050, and 49.17.240. 80-11-010 (Order 80-14), § 296-62-14501, filed 8/8/80; Order 73-3, § 296-62-14501, filed 5/7/73.]

**WAC 296-62-14503 Personnel requirements for entry into confined spaces.** Workmen required to enter confined spaces shall be protected from the hazards which may result from the entry.

(1) Management shall be responsible for procedures, training, and planning for entry into confined spaces which present a problem due to toxicity, flammability, oxygen deficiency or excess, mechanical, electrical, corrosive or temperature hazard.

(2) Management shall develop, distribute and enforce a written procedure which shall include planning, general precautions, procedures, evaluation of hazards, ventilation requirements, personal protection, isolation and responsibilities.

(3) For each project or job, individuals who are competent in the evaluation of hazards, precautions, first aid and artificial respiration shall specifically be assigned. All personnel shall be trained in the use of personal protective equipment required for the job assignment.

(4) Management shall instruct all involved employees in the safe procedures to be followed.

[Order 73-3, § 296-62-14503, filed 5/7/73.]

**WAC 296-62-14505 General precautions.** (1) Toxic or flammable atmospheres. Employees shall not be permitted to enter atmospheres in a confined space which has contained toxic, flammable or corrosive materials or which may have had such materials accidentally introduced or generated until such space has been evaluated and/or tested by a competent person who shall declare the space safe for entry.

(2) Exposure to temperature extremes and noise shall be controlled as defined in WAC 296-62-09011 and 296-62-09013.



(3) Exposure to ionizing radiation shall be controlled as defined in rules and regulations for radiation protection, chapter 402-12 WAC as administered by the state of Washington, department of social and health services, health services division.

[Order 73-3, § 296-62-14505, filed 5/7/73.]

**WAC 296-62-14507 Toxic atmospheres.** (1) Atmospheres where contamination is below permissible exposure limits as defined in chapter 296-62 WAC may be entered without respiratory protection.

(2) Atmospheres where contamination is above the permissible exposure limits but below values immediately hazardous to life or health may be entered when respiratory protective equipment as defined in the applicable provisions of chapter 296-62 WAC is properly worn.

(3) Atmospheres immediately hazardous to life may be entered only in the event of emergency and then only when employees are protected by equipment approved for such exposures.

(4) Atmospheres where the toxicity is not known shall require full protection.

(5) Entry into spaces which contain or could contain corrosive chemicals or chemicals which are toxic through skin absorption shall require equipment to prevent skin and/or eye contact.

[Statutory Authority: RCW 49.17.040, 49.17.050, and 49.17.240. 81-16-015 (Order 81-20), § 296-62-14507, filed 7/27/81; 80-11-010 (Order 80-14), § 296-62-14507, filed 8/8/80; Order 73-3, § 296-62-14507, filed 5/7/73.]

**WAC 296-62-14509 Flammable atmospheres.** Atmospheres which contain or could contain flammable gases or vapors shall not be entered if the concentration of gases or vapors in any part of the area is more than 20% of the lower explosive limit except in the event of emergency and then only when employees are protected by equipment approved for such exposures.

[Order 73-3, § 296-62-14509, filed 5/7/73.]

**WAC 296-62-14511 Oxygen deficiency or excess.**

(1) All employees required to enter into confined spaces shall be instructed as to the nature of the hazards involved, the necessary precautions to be taken and in the use of protective and emergency equipment required. The employer shall comply with any specific regulations that apply to work in dangerous or potentially dangerous areas.

(2) Atmospheres having an oxygen content less than 18% oxygen at sea level (this may deviate at higher elevations) shall not be entered without approved respiratory protective equipment which will provide an adequate supply of breathing air.

(3) In the event that the air may be diluted by an unknown gas, the atmosphere shall be considered highly toxic and/or flammable.

[Order 73-3, § 296-62-14511, filed 5/7/73.]

**WAC 296-62-14513 Mechanical hazards.** (1) Confined areas containing parts which may move or which

contain agitators, fans or other power driven moving parts of potential hazard to employees shall not be entered until it is assured that such parts cannot move to injure the employee.

(a) Open and lock circuit breakers or switches, or remove fuses or disconnect wiring and tag the location.

(b) Disconnect and tag belt or mechanical linkage.

(c) Physically block part against movement and tag switches, clutches or other means of control.

(d) Tagging of controls without other means of control shall be considered satisfactory only if the control is barricaded and/or is under constant observation during occupancy of the space.

[Order 73-3, § 296-62-14513, filed 5/7/73.]

**WAC 296-62-14515 Electrical hazards.** (1) Electrical circuits in the confined area which may present a hazard shall be disconnected, locked out and tagged in accordance with WAC 296-62-14513(1)(a). All temporary lights shall be protected against damage and cords shall be heavy duty and kept clear of working spaces and walkways. Only low voltage, battery operated, or ground fault protected equipment shall be used on water-sides of boilers or when electrically conductive liquids are involved.

(2) Electric supply circuits, lighting, portable tools, and other equipment used where potentially hazardous concentrations of flammable vapors, gases or dusts are present or may develop shall conform to the current National Electric Code requirements.

(3) Portable electric tools shall be grounded or isolation transformers, ground fault interrupters or double insulated tools shall be required.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 83-15-017 (Order 83-19), § 296-62-14515, filed 7/13/83, effective 9/12/83; 82-13-045 (Order 82-22), § 296-62-14515, filed 6/11/82; Order 73-3, § 296-62-14515, filed 5/7/73.]

**WAC 296-62-14517 Procedures for entry into toxic or flammable atmospheres.** Every reasonable effort shall be made to reduce the hazard to safe levels prior to permitting entry into the enclosed space.

(1) Preliminary preparations.

(a) Determine type and extent of contamination including gases, liquids, sludge, residue or absorbed and/or absorbed material.

(b) Survey area to determine the effect of escape of gases or vapors in surrounding areas.

(c) Post or barricade area to prevent unauthorized entry.

(d) Ensure control of all sources of ignition when a potential fire hazard exists.

(e) Collect and inspect the condition of all equipment needed including pumps, ventilating equipment, personal protective equipment, atmospheric testing equipment and mechanical equipment. Ensure that all equipment is in good condition and is compatible with the work involved.

(f) Ensure that all required personnel are available and familiar with the hazards.

[Order 73-3, § 296-62-14517, filed 5/7/73.]

**WAC 296-62-14519 Removal of flammable or toxic material.** (1) Remove all possible liquid product, sludge or residue if present by draining, pumping or washing as applicable. Dispose of solid, liquid or gaseous materials in a manner which will not cause air or water pollution, a fire hazard or endanger workmen or equipment.

(2) Vent any pressure as required.

(3) Isolate tank or confined space from all potential sources of hazardous materials by one of the following:

(a) Remove a valve, spool piece, or expansion joint and cap open ends. Tag line.

(b) Insert a blank in the line and tag it.

[Order 73-3, § 296-62-14519, filed 5/7/73.]

**WAC 296-62-14521 Vapor freeing.** (1) Vapor Freeing is usually done by ventilation. The effectiveness of ventilation is dependent upon the number of air changes and the efficiency of mixing of the air with the gas in the tank. Ventilation by supply air provides more efficient mixing than exhaust air but cannot be used if it creates a hazard near the discharge point. Exhaust air ducts must be placed at locations remote from air inlets and may require moving to various locations.

(2) Prior to entry, a minimum of five air changes is recommended where oxygen deficiency may exist and ten air changes is recommended where a toxic and/or flammable material is involved.

(3) Concentrations of vapors or gases in the flammable or above the flammable range may require replacement by an inerting gas such as nitrogen or carbon dioxide to prevent explosions.

(a) When inert gases are used, they must subsequently be replaced by air prior to entry except when the inerting provides safer working conditions.

(4) All fans and other equipment used for removing flammable gases or vapors shall conform to NFPA requirements and shall not create an ignition hazard.

(5) Oxygen shall never be used for ventilation.

[Order 73-3, § 296-62-14521, filed 5/7/73.]

**WAC 296-62-14523 Evaluation of potentially hazardous atmospheres.** Evaluation of the atmospheres shall be made by competent personnel.

(1) Atmospheric tests shall be made using accepted procedures and/or instruments to determine the kind and extent of any hazards present. However, atmospheric tests should be supplemented by other types of evaluation.

(2) Evaluation shall consider such factors as degree of toxicity, flammability, oxygen deficiency, noise, temperature, vapor pressures, sorption on surface, sludges, residue and ventilation rates.

(3) Evaluation shall be made immediately prior to entry and during occupation at intervals dependent on the possibility of changing conditions.

(4) Testing or other evaluation shall be made in all locations where employees may be exposed.

(5) If there is any doubt as to the validity of evaluation, the hazard shall be assumed to be high, and personal protective equipment or measures used accordingly.

(1989 Ed.)

[Order 73-3, § 296-62-14523, filed 5/7/73.]

**WAC 296-62-14525 Entry into confined space.** After initial cleaning, vapor freeing, and evaluation of the atmosphere, the confined space may be entered to complete cleaning, repair or other work.

(1) Respiratory protective equipment shall be used when indicated.

(2) An observer capable of maintaining communication at all times shall be located outside the confined space. He shall have respiratory protection available when indicated.

(3) If the possibility of a highly toxic or flammable atmosphere, or oxygen deficiency exists or can develop, workers shall wear safety harness with lifeline attached and a means of rescue shall be provided.

(4) Fire extinguishing equipment shall be immediately available when indicated.

(5) Ventilation shall be maintained at all times when employees are in confined spaces except when the atmosphere has been purposely inerted to provide safer working conditions. All work shall stop and the area shall be evacuated if ventilation fails.

(6) All tools and equipment shall be available as required.

(7) Emergency lighting shall be available as required.

(8) The area shall be evacuated if any indication of ill effects such as dizziness, irritation or excessive odors are noted.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 82-03-023 (Order 82-1), § 296-62-14525, filed 1/15/82; Order 73-3, § 296-62-14525, filed 5/7/73.]

**WAC 296-62-14527 Hot work.** (1) Any hot work involving sources of ignition and including welding and burning shall require positive assurance that fire hazards and flammable atmospheres have been controlled. Combustible material shall be protected.

(2) Usually the atmosphere should be tested by a combustible gas indicator and/or other device as indicated. Tests should be made frequently enough to assure that safe conditions prevail.

(3) Hot work permits are required prior to entry.

(4) Where hot work involves the generation of toxic gases, vapors, or fumes, local exhaust and/or respiratory protection shall be required.

(5) Compressed gas cylinders should not generally be allowed in confined spaces. Compressed gas lines shall be protected from rupture or damage.

(6) Compressed gas cylinders or electric generators should be attended at all times. Sources of compressed gases or arc welding power shall be turned off immediately when an emergency arises or when work is interrupted or completed.

[Order 73-3, § 296-62-14527, filed 5/7/73.]

**WAC 296-62-14529 Use of toxic and/or flammable materials in confined spaces.** Work in confined spaces frequently requires the use of toxic or flammable materials. These include but are not confined to coatings, linings, paints, cements, and solvents.

[Title 296 WAC—p 1593]

(1) Quantities of toxic or flammable materials brought into or used in confined spaces shall be limited to the smallest amount consistent with efficient use.

(2) Containers shall be designed to minimize evaporation and spillage. Safety cans or small squeeze bottles are preferable when applicable.

(3) Continuous ventilation shall be provided in sufficient quantity and design to control fire and health hazards.

(4) Atmospheres shall be tested and/or evaluated to provide positive assurance that hazards do not exist. In no instance shall flammable vapor concentrations exceed 20% of the lower explosive limit. Evaluation shall be repeated at intervals to ensure no hazardous build up of concentrations.

(5) Spraying of toxic or flammable substances such as paint is not recommended.

(6) Respiratory protective equipment shall be used as defined in WAC 296-62-14507.

(7) Sources of ignition shall be eliminated when flammable liquids are used.

(8) Materials, equipment and training shall be provided to clean up spills.

(9) All applicable instructions or recommendations from the manufacturer shall be enforced.

[Order 73-3, § 296-62-14529, filed 5/7/73.]

#### PART N--COTTON DUST

**WAC 296-62-14533 Cotton dust.** (1) Scope and application.

(a) This section, in its entirety, applies to the control of employee exposure to cotton dust in all workplaces where employees engage in yarn manufacturing, engage in slashing and weaving operations, or work in waste houses for textile operations.

(b) This section does not apply to the handling or processing of woven or knitted materials; to maritime operations covered by chapters 296-56 and 296-304 WAC; to harvesting or ginning of cotton; or to the construction industry.

(c) Only subsection (8) Medical surveillance, subsection (11) (b) Medical surveillance, subsection (11)(c) Availability, subsection (11)(d) Transfer of records, and Appendices B, C, and D of this section apply in all workplaces where employees exposed to cotton dust engage in cottonseed processing or waste processing operations.

(d) This section applies to yarn manufacturing and slashing and weaving operations exclusively using washed cotton (as defined by subsection (14) of this section) only to the extent specified by subsection (14) of this section.

(e) This section, in its entirety, applies to the control of all employees exposure to the cotton dust generated in the preparation of washed cotton from opening until the cotton is thoroughly wetted.

(f) This section does not apply to knitting, classing or warehousing operations except that employers with these operations, if requested by WISHA, shall grant WISHA access to their employees and workplaces for exposure

monitoring and medical examinations for purposes of a health study to be performed by WISHA on a sampling basis.

(2) Definitions applicable to this section:

(a) "Blow down" – the cleaning of equipment and surfaces with compressed air.

(b) "Blow off" – the use of compressed air for cleaning of short duration and usually for a specific machine or any portion of a machine.

(c) "Cotton dust" – dust present in the air during the handling or processing of cotton, which may contain a mixture of many substances including ground-up plant matter, fiber, bacteria, fungi, soil, pesticides, noncotton plant matter and other contaminants which may have accumulated with the cotton during the growing, harvesting and subsequent processing or storage periods. Any dust present during the handling and processing of cotton through the weaving or knitting of fabrics, and dust present in other operations or manufacturing processes using raw or waste cotton fibers or cotton fiber byproducts from textile mills are considered cotton dust within this definition. Lubricating oil mist associated with weaving operations is not considered cotton dust.

(d) "Director" – the director of labor and industries or his authorized representative.

(e) "Equivalent instrument" – a cotton dust sampling device that meets the vertical elutriator equivalency requirements as described in subsection (4)(a)(iii) of this section.

(f) "Lint-free respirable cotton dust" – particles of cotton dust of approximately 15 microns or less aerodynamic equivalent diameter.

(g) "Vertical elutriator cotton dust sampler" or "vertical elutriator" – a dust sampler which has a particle size cut-off at approximately 15 microns aerodynamic equivalent diameter when operating at the flow rate of  $7.4 \pm 0.2$  liters per minute.

(h) "Waste processing" – waste recycling (sorting, blending, cleaning and willowing) and garnetting.

(i) "Yarn manufacturing" – all textile mill operations from opening to, but not including, slashing and weaving.

(3) Permissible exposure limits and action levels.

(a) Permissible exposure limits (PEL).

(i) The employer shall assure that no employee who is exposed to cotton dust in yarn manufacturing and cotton washing operations is exposed to airborne concentrations of lint-free respirable cotton dust greater than  $200 \mu\text{g}/\text{m}^3$  mean concentration, averaged over an eight-hour period, as measured by a vertical elutriator or an equivalent instrument.

(ii) The employer shall assure that no employee who is exposed to cotton dust in textile mill waste house operations or is exposed in yarn manufacturing to dust from "lower grade washed cotton" as defined in subsection (14)(e) of this section is exposed to airborne concentrations of lint-free respirable cotton dust greater than  $500 \mu\text{g}/\text{m}^3$  mean concentration, averaged over an eight-hour period, as measured by a vertical elutriator or an equivalent instrument.

(iii) The employer shall assure that no employee who is exposed to cotton dust in the textile processes known as slashing and weaving is exposed to airborne concentrations of lint-free respirable cotton dust greater than  $750 \mu\text{g}/\text{m}^3$  mean concentration, averaged over an eight-hour period, as measured by a vertical elutriator or an equivalent instrument.

(b) Action levels.

(i) The action level for yarn manufacturing and cotton washing operations is an airborne concentration of lint-free respirable cotton dust of  $100 \mu\text{g}/\text{m}^3$  mean concentration, averaged over an eight-hour period, as measured by a vertical elutriator or an equivalent instrument.

(ii) The action level for waste houses for textile operations is an airborne concentration of lint-free respirable cotton dust of  $250 \mu\text{g}/\text{m}^3$  mean concentration, averaged over an eight-hour period, as measured by a vertical elutriator or an equivalent instrument.

(iii) The action level for the textile processes known as slashing and weaving is an airborne concentration of lint-free respirable cotton dust of  $375 \mu\text{g}/\text{m}^3$  mean concentration, averaged over an eight-hour period, as measured by a vertical elutriator or an equivalent instrument.

(4) Exposure monitoring and measurement.

(a) General.

(i) For the purposes of this section, employee exposure is that exposure which would occur if the employee were not using a respirator.

(ii) The sampling device to be used shall be either the vertical elutriator cotton dust sampler or an equivalent instrument.

(iii) If an alternative to the vertical elutriator cotton dust sampler is used, the employer shall establish equivalency by demonstrating that the alternative sampling devices:

(A) It collects respirable particulates in the same range as the vertical elutriator (approximately 15 microns);

(B) Replicate exposure data used to establish equivalency are collected in side-by-side field and laboratory comparisons; and

(C) A minimum of 100 samples over the range of 0.5 to 2 times the permissible exposure limit are collected, and ninety percent of these samples have an accuracy range of plus or minus twenty-five percent of the vertical elutriator reading with a ninety-five percent confidence level as demonstrated by a statistically valid protocol. (An acceptable protocol for demonstrating equivalency is described in Appendix E of this section.)

(iv) WISHA will issue a written opinion stating that an instrument is equivalent to a vertical elutriator cotton dust sampler if:

(A) A manufacturer or employer requests an opinion in writing and supplies the following information:

(I) Sufficient test data to demonstrate that the instrument meets the requirements specified in this paragraph and the protocol specified in Appendix E of this section;

(II) Any other relevant information about the instrument and its testing requested by WISHA; and

(III) A certification by the manufacturer or employer that the information supplied is accurate, and

(B) If WISHA finds, based on information submitted about the instrument, that the instrument meets the requirements for equivalency specified by this subsection.

(b) Initial monitoring. Each employer who has a place of employment within the scope of subsections (1)(a), (d) or (e) of this section shall conduct monitoring by obtaining measurements which are representative of the exposure of all employees to airborne concentrations of lint-free respirable cotton dust over an eight-hour period. The sampling program shall include at least one determination during each shift for each work area.

(c) Periodic monitoring.

(i) If the initial monitoring required by (4)(b) of this section or any subsequent monitoring reveals employee exposure to be at or below the permissible exposure limit, the employer shall repeat the monitoring for those employees at least annually.

(ii) If the initial monitoring required by (4)(b) of this section or any subsequent monitoring reveals employee exposure to be above the PEL, the employer shall repeat the monitoring for those employees at least every six months.

(iii) Whenever there has been a production, process, or control change which may result in new or additional exposure to cotton dust, or whenever the employer has any other reason to suspect an increase in employee exposure, the employer shall repeat the monitoring and measurements for those employees affected by the change or increase.

(d) Employee notification.

(i) Within twenty working days after the receipt of monitoring results, the employer shall notify each employee in writing of the exposure measurements which represent that employee's exposure.

(ii) Whenever the results indicate that the employee's exposure exceeds the applicable permissible exposure limit specified in subsection (3) of this section, the employer shall include in the written notice a statement that the permissible exposure limit was exceeded and a description of the corrective action taken to reduce exposure below the permissible exposure limit.

(5) Methods of compliance.

(a) Engineering and work practice controls. The employer shall institute engineering and work practice controls to reduce and maintain employee exposure to cotton dust at or below the permissible exposure limit specified in subsection (3) of this section, except to the extent that the employer can establish that such controls are not feasible.

(b) Whenever feasible engineering and work practice controls are not sufficient to reduce employee exposure to or below the permissible exposure limit, the employer shall nonetheless institute these controls to immediately reduce exposure to the lowest feasible level, and shall supplement these controls with the use of respirators which shall comply with the provisions of subsection (6) of this section.

(c) Compliance program.

(i) Where the most recent exposure monitoring data indicates that any employee is exposed to cotton dust levels greater than the permissible exposure limit, the employer shall establish and implement a written program sufficient to reduce exposures to or below the permissible exposure limit solely by means of engineering controls and work practices as required by (a) of this subsection.

(ii) The written program shall include at least the following:

(A) A description of each operation or process resulting in employee exposure to cotton dust;

(B) Engineering plans and other studies used to determine the controls for each process;

(C) A report of the technology considered in meeting the permissible exposure limit;

(D) Monitoring data obtained in accordance with subsection (4) of this section;

(E) A detailed schedule for development and implementation of engineering and work practice controls, including exposure levels projected to be achieved by such controls;

(F) Work practice program; and

(G) Other relevant information.

(iii) The employer's schedule as set forth in the compliance program, shall project completion of the implementation of the compliance program no later than March 27, 1984 or as soon as possible if monitoring after March 27, 1984 reveals exposures over the PEL, except as provided in (13)(b)(ii)(B) of this section.

(iv) The employer shall complete the steps set forth in his program by the dates in the schedule.

(v) Written programs shall be submitted, upon request, to the director, and shall be available at the worksite for examination and copying by the director, and any affected employee or their designated representatives.

(vi) The written programs required under subsection (5)(c) of this section shall be revised and updated at least every six months to reflect the current status of the program and current exposure levels.

(d) Mechanical ventilation. When mechanical ventilation is used to control exposure, measurements which demonstrate the effectiveness of the system to control exposure, such as capture velocity, duct velocity, or static pressure shall be made at reasonable intervals.

(6) Use of respirators.

(a) General. Where the use of respirators is required under this section, the employer shall provide, at no cost to the employee, and assure the use of respirators which comply with the requirements of this subsection (6). Respirators shall be used in the following circumstances:

(i) During the time periods necessary to install or implement feasible engineering controls and work practice controls;

(ii) During maintenance and repair activities in which engineering and work practice controls are not feasible;

(iii) In work situations where feasible engineering and work practice controls are not yet sufficient to reduce exposure to or below the permissible exposure limits;

(iv) In operations specified under subsection (7)(a) of this section; and

(v) Whenever an employee requests a respirator.

(b) Respirator selection.

(i) Where respirators are required under this section, the employer shall select the appropriate respirator from Table I and shall assure that the employee uses the respirator provided.

TABLE I

Cotton dust concentration	Required respirator
Not greater than—	
(a) 5 x the applicable permissible exposure limit (PEL).	A disposable respirator with a particulate filter.
(b) 10 x the applicable PEL.	A quarter or half-mask respirator, other than a disposable respirator, equipped with particulate filters.
(c) 100 x the applicable PEL.	A full facepiece respirator equipped with high-efficiency particulate filters.
(d) Greater than 100 x the applicable PEL.	A powered air-purifying respirator equipped with high-efficiency particulate filters.

## Notes

1. A disposable respirator means the filter element is an inseparable part of the respirator.

2. Any respirators permitted at higher environmental concentrations can be used at lower concentrations.

3. Self-contained breathing apparatus are not required respirators but are permitted respirators.

4. Supplied air respirators are not required but are permitted under the following conditions: Cotton dust concentration not greater than 10X the PEL—Any supplied air respirator; not greater than 100X the PEL—Any supplied air respirator with full facepiece, helmet or hood; greater than 100X the PEL—A supplied air respirator operated in positive pressure mode.

(ii) The employer shall select respirators from those tested and approved for protection against dust by the National Institute for Occupational Safety and Health (NIOSH) under the provisions of 30 CFR Part 11.

(iii) Whenever respirators are required by this section for concentrations not greater than 100 x the applicable permissible exposure limit, the employer shall, upon the request of the employee, provide a powered air purifying respirator with a high efficiency particulate filter in lieu of the respirator specified in paragraphs (a), (b), or (c) of Table I.

(iv) Whenever a physician determines that an employee who works in an area in which the dust level exceeds the PEL is unable to wear any form of respirator, including a powered air purifying respirator, the employee shall be given the opportunity to transfer to another position which is available or which later becomes available having a dust level at or below the PEL. The employer shall assure that an employee who is transferred from an area in which the dust level exceeds the PEL due to an inability to wear a respirator suffers no reduction in current wage rate or other benefits as a result of the transfer.

(c) Respirator program. The employer shall institute a respirator program in accordance with WAC 296-62-071.

(d) Respirator usage.

(i) The employer shall assure that the respirator used by each employee exhibits minimum face piece leakage and that the respirator is fitted properly.

(ii) The employer shall allow each employee who uses a filter respirator, to change the filter elements whenever an increase in breathing resistance is detected by the employee. The employer shall maintain an adequate supply of filter elements for this purpose.

(iii) The employer shall allow employees who wear respirators to wash their faces and respirator face pieces to prevent skin irritation associated with respirator use.

(7) Work practices. Each employer shall, regardless of the level of employee exposure, immediately establish and implement a written program of work practices which shall minimize cotton dust exposure. The following shall be included where applicable:

(a) Compressed air "blow down" cleaning shall be prohibited, where alternative means are feasible. Where compressed air is used for cleaning, the employees performing the "blow down" or "blow off" shall wear suitable respirators. Employees whose presence is not required to perform "blow down" or "blow off" shall be required to leave the area affected by the "blow down" or "blow off" during this cleaning operation.

(b) Cleaning of clothing or floors with compressed air shall be prohibited.

(c) Floor sweeping shall be performed with a vacuum or with methods designed to minimize dispersal of dust.

(d) In areas where employees are exposed to concentrations of cotton dust greater than the permissible exposure limit, cotton and cotton waste shall be stacked, sorted, baled, dumped, removed or otherwise handled by mechanical means, except where the employer can show that it is infeasible to do so. Where infeasible, the method used for handling cotton and cotton waste shall be the method which reduces exposure to the lowest level feasible.

(8) Medical surveillance.

(a) General.

(i) Each employer covered by the standard shall institute a program of medical surveillance for all employees exposed to cotton dust.

(ii) The employer shall assure that all medical examinations and procedures are performed by or under the supervision of a licensed physician and are provided without cost to the employee.

(iii) Persons other than licensed physicians, who administer the pulmonary function testing required by this section shall have completed a NIOSH approved training course in spirometry.

(b) Initial examinations. The employer shall provide medical surveillance to each employee who is or may be exposed to cotton dust. For new employees' this examination shall be provided prior to initial assignment. The medical surveillance shall include at least the following:

(i) A medical history;

(ii) The standardized questionnaire contained in WAC 296-62-14537; and

(iii) A pulmonary function measurement, including a determination of forced vital capacity (FVC) and forced expiratory volume in one second (FEV<sub>1</sub>), the FEV<sub>1</sub>/FVC ratio, and the percentage that the measured values of FEV<sub>1</sub> and FVC differ from the predicted values, using the standard tables in WAC 296-62-14539. These determinations shall be made for each employee before the employee enters the workplace on the first day of the work week, preceded by at least thirty-five hours of no exposure to cotton dust. The tests shall be repeated during the shift, no less than four hours and no more than ten hours after the beginning of the work shift; and, in any event, no more than one hour after cessation of exposure. Such exposure shall be typical of the employee's usual workplace exposure. The predicted FEV<sub>1</sub> and FVC for blacks shall be multiplied by 0.85 to adjust for ethnic differences.

(iv) Based upon the questionnaire results, each employee shall be graded according to Schilling's byssinosis classification system.

(c) Periodic examinations.

(i) The employer shall provide at least annual medical surveillance for all employees exposed to cotton dust above the action level in yarn manufacturing, slashing and weaving, cotton washing and waste house operations. The employer shall provide medical surveillance at least every two years for all employees exposed to cotton dust at or below the action level, for all employees exposed to cotton dust from washed cotton (except from washed cotton defined in subsection (9)(c) of this section), and for all employees exposed to cotton dust in cottonseed processing and waste processing operations. Periodic medical surveillance shall include at least an update of the medical history, standardized questionnaire (Appendix B-111), Schilling byssinosis grade, and the pulmonary function measurements in (b)(iii) of this subsection.

(ii) Medical surveillance as required in (c)(i) of this subsection shall be provided every six months for all employees in the following categories:

(A) An FEV<sub>1</sub> of greater than eighty percent of the predicted value, but with an FEV<sub>1</sub> decrement of five percent or 200 ml. on a first working day;

(B) An FEV<sub>1</sub> of less than eighty percent of the predicted value; or

(C) Where, in the opinion of the physician, any significant change in questionnaire findings, pulmonary function results, or other diagnostic tests have occurred.

(iii) An employee whose FEV<sub>1</sub> is less than sixty percent of the predicted value shall be referred to a physician for a detailed pulmonary examination.

(iv) A comparison shall be made between the current examination results and those of previous examinations and a determination made by the physician as to whether there has been a significant change.

(d) Information provided to the physician. The employer shall provide the following information to the examining physician:

(i) A copy of this regulation and its appendices;



(ii) A description of the affected employee's duties as they relate to the employee's exposure;

(iii) The employee's exposure level or anticipated exposure level;

(iv) A description of any personal protective equipment used or to be used; and

(v) Information from previous medical examinations of the affected employee which is not readily available to the examining physician.

(e) Physician's written opinion.

(i) The employer shall obtain and furnish the employee with a copy of a written opinion from the examining physician containing the following:

(A) The results of the medical examination and tests including the FEV<sub>1</sub>, FVC, and FEV<sub>1</sub>/FVC ratio;

(B) The physician's opinion as to whether the employee has any detected medical conditions which would place the employee at increased risk of material impairment of the employee's health from exposure to cotton dust;

(C) The physician's recommended limitations upon the employee's exposure to cotton dust or upon the employee's use of respirators including a determination of whether an employee can wear a negative pressure respirator, and where the employee cannot, a determination of the employee's ability to wear a powered air purifying respirator; and

(D) A statement that the employee has been informed by the physician of the results of the medical examination and any medical conditions which require further examination or treatment.

(ii) The written opinion obtained by the employer shall not reveal specific findings or diagnoses unrelated to occupational exposure.

(9) Employee education and training.

(a) Training program.

(i) The employer shall provide a training program for all employees exposed to cotton dust and shall assure that each employee is informed of the following:

(A) The acute and long term health hazards associated with exposure to cotton dust;

(B) The names and descriptions of jobs and processes which could result in exposure to cotton dust at or above the PEL.

(C) The measures, including work practices required by subsection (7) of this section, necessary to protect the employee from exposures in excess of the permissible exposure limit;

(D) The purpose, proper use and limitations of respirators required by subsection (6) of this section;

(E) The purpose for and a description of the medical surveillance program required by subsection (8) of this section and other information which will aid exposed employees in understanding the hazards of cotton dust exposure; and

(F) The contents of this standard and its appendices.

(ii) The training program shall be provided prior to initial assignment and shall be repeated annually for each employee exposed to cotton dust, when job assignments or work processes change and when employee performance indicates a need for retraining.

(b) Access to training materials.

(i) Each employer shall post a copy of this section with its appendices in a public location at the workplace, and shall, upon request, make copies available to employees.

(ii) The employer shall provide all materials relating to the employee training and information program to the director upon request.

(10) Signs. The employer shall post the following warning sign in each work area where the permissible exposure limit for cotton dust is exceeded:

WARNING

COTTON DUST WORK AREA  
MAY CAUSE ACUTE OR DELAYED LUNG INJURY  
(BYSSINOSIS)

RESPIRATORS REQUIRED IN THIS AREA

(11) Recordkeeping.

(a) Exposure measurements.

(i) The employer shall establish and maintain an accurate record of all measurements required by subsection (4) of this section.

(ii) The record shall include:

(A) A log containing the items listed in WAC 296-62-14535 (4)(a), and the dates, number, duration, and results of each of the samples taken, including a description of the procedure used to determine representative employee exposures;

(B) The type of protective devices worn, if any, and length of time worn; and

(C) The names, social security number, job classifications, and exposure levels of employees whose exposure the measurement is intended to represent.

(iii) The employer shall maintain this record for at least twenty years.

(b) Medical surveillance.

(i) The employer shall establish and maintain an accurate medical record for each employee subject to medical surveillance required by subsection (8) of this section.

(ii) The record shall include:

(A) The name and social security number and description of the duties of the employee;

(B) A copy of the medical examination results including the medical history, questionnaire response, results of all tests, and the physician's recommendation;

(C) A copy of the physician's written opinion;

(D) Any employee medical complaints related to exposure to cotton dust;

(E) A copy of this standard and its appendices, except that the employer may keep one copy of the standard and the appendices for all employees, provided that he references the standard and appendices in the medical surveillance record of each employee; and

(F) A copy of the information provided to the physician as required by subsection (8)(d) of this section.

(iii) The employer shall maintain this record for at least twenty years.

(c) Availability.



(i) The employer shall make all records required to be maintained by subsection (11) of this section available to the director for examination and copying.

(ii) Employee exposure measurement records and employee medical records required by this subsection shall be provided upon request to employees, designated representatives, and the assistant director in accordance with WAC 296-62-05201 through 296-62-05209 and 296-62-05213 through 296-62-05217.

(d) Transfer of records.

(i) Whenever the employer ceases to do business, the successor employer shall receive and retain all records required to be maintained by subsection (11) of this section.

(ii) Whenever the employer ceases to do business, and there is no successor employer to receive and retain the records for the prescribed period, these records shall be transmitted to the director.

(iii) At the expiration of the retention period for the records required to be maintained by this section, the employer shall notify the director at least three months prior to the disposal of such records and shall transmit those records to the director if he requests them within that period.

(iv) The employer shall also comply with any additional requirements involving transfer of records set forth in WAC 296-62-05215.

(12) Observation of monitoring.

(a) The employer shall provide affected employees or their designated representatives an opportunity to observe any measuring or monitoring of employee exposure to cotton dust conducted pursuant to subsection (4) of this section.

(b) Whenever observation of the measuring or monitoring of employee exposure to cotton dust requires entry into an area where the use of personal protective equipment is required, the employer shall provide the observer with and assure the use of such equipment and shall require the observer to comply with all other applicable safety and health procedures.

(c) Without interfering with the measurement, observers shall be entitled to:

(i) An explanation of the measurement procedures;

(ii) An opportunity to observe all steps related to the measurement of airborne concentrations of cotton dust performed at the place of exposure; and

(iii) An opportunity to record the results obtained.

(13) Effective date.

(a) General. This emergency rule is effective upon filing with the code reviser, except as otherwise provided below.

(b) Startup dates.

(i) Initial monitoring. The initial monitoring required by subsection (4)(b) of this section shall be completed as soon as possible but no later than September 27, 1980.

(ii) Methods of compliance;

(A) The engineering and work practice controls required by subsection (5) of this section shall be implemented no later than March 27, 1984 except as set forth in (13)(b)(ii)(B) of this section.

(B) The engineering and work practice controls required by subsection (5) of this section shall be implemented no later than March 27, 1986, for ring spinning operations (including only ring spinning and winding, twisting, spooling, beaming and warping following ring spinning) where the operations meet the following criteria:

(I) The weight of the yarn being run is one hundred percent cotton and the average yarn count by weight is eighteen or below;

(II) The average weight of the yarn run is eighty percent or more cotton and the average yarn count by weight is sixteen or below; or

(III) The average weight of the yarn being run is fifty percent or more cotton and the average yarn count by weight is fourteen or below:

(C) When the provisions of (b)(ii)(B) of this subsection are being relied upon, the following definitions shall apply:

(I) The average cotton content shall be determined by dividing the total weight of cotton in the yarns being run by the total weight of all the yarns being run in the relevant work area.

(II) The average yarn count shall be determined by multiplying the yarn count times the pounds of each particular yarn being run to get the "total hank" for each of the yarns being run in the relevant area. The "total hank" values for all of the yarns being run should then be summed and divided by the total pounds of yarn being run, to produce the average yarn count number for all the yarns being run in the relevant work area.

(D) Where the provisions of (b)(ii)(B) of this subsection are being relied upon, the employer shall update the employer's compliance plan no later than February 13, 1986, to indicate the steps being taken to reduce cotton dust levels to 200  $\mu\text{g}/\text{m}^3$  through the use of engineering and work practice controls by March 27, 1986.

(E) Where the provisions of (b)(ii)(B) of this subsection are being relied upon, the employer shall maintain airborne concentrations of cotton dust below 1000  $\mu\text{g}/\text{m}^3$  mean concentration averaged over an eight-hour period measured by a vertical elutriator or an equivalent instrument with engineering and work practice controls and shall maintain the permissible exposure limit specified by subsection (3)(a)(i) of this section with any combination of engineering controls, work practice controls and respirators.

(iii) Compliance program. The compliance program required by subsection (5)(c) of this section shall be established no later than March 27, 1981.

(iv) Respirators. The respirators required by subsection (6) of this section shall be provided no later than April 27, 1980.

(v) Work practices. The work practices required by subsection (7) of this section shall be implemented no later than June 27, 1980.

(vi) Medical surveillance. The medical surveillance required by subsection (8) of this section shall be completed no later than March 27, 1981 for the textile industry and no later than June 13, 1986 for the cotton seed processing and waste processing industry.

(vii) Employee education and training. The initial education and training required by subsection (9) of this section shall be completed as soon as possible but no later than June 27, 1980.

(14) Washed cotton.

(a) Exemptions. Cotton, after it has been washed by the processes described in this section is exempt from all or parts of this section as specified if the requirements of this section are met.

(b) Initial requirements.

(i) In order for an employer to qualify as exempt or partially exempt from this standard for operations using washed cotton, the employer must demonstrate that the cotton was washed in a facility which is open to inspection by the director and the employer must provide sufficient accurate documentary evidence to demonstrate that the washing methods utilized meet the requirements of this section.

(ii) An employer who handles or processes cotton which has been washed in a facility not under the employer's control and claims an exemption or partial exemption under this paragraph, must obtain from the cotton washer and make available at the worksite, to the director, or his designated representative, to any affected employee, or to their designated representative the following:

(A) A certification by the washer of the cotton of the grade of cotton, the type of washing process, and that the batch meets the requirements of this section:

(B) Sufficient accurate documentation by the washer of the cotton grades and washing process; and

(C) An authorization by the washer that the director may inspect the washer's washing facilities and documentation of the process.

(c) Medical and dyed cotton. Medical grade (USP) cotton, cotton that has been scoured, bleached and dyed, and mercerized yarn shall be exempt from all provisions of this standard.

(d) Higher grade washed cotton. The handling or processing of cotton classed as "low middling light spotted or better" which has been washed:

(i) On a continuous batt system or a rayon rinse system.

(ii) With water,

(iii) At a temperature of no less than 60°C,

(iv) With a water-to-fiber ratio of no less than 40:1, and

(v) With bacterial levels in the wash water controlled to limit bacterial contamination of the cotton, shall be exempt from all provisions of the standard except the requirements of subsection (8) Medical surveillance, subsection (11)(b) Medical surveillance, subsection (11)(c) Availability, subsection (11)(d) Transfer of records, and Appendices B, C, and D of this section.

(e) Lower grade washed cotton. The handling and processing of cotton of grades lower than "low middling light spotted," that has been washed as specified in (d) of this subsection and has also been bleached, shall be exempt from all provisions of the standard except the requirements of subsection (3)(a) Permissible exposure

limits, subsection (4) Exposure monitoring and measurement, subsection (8) Medical surveillance, subsection (11) Recordkeeping, and Appendices B, C and D of this section.

(f) Mixed grades of washed cotton. If more than one grade of washed cotton is being handled or processed together, the requirements of the grade with the most stringent exposure limit, medical and monitoring requirements shall be followed.

(15) Appendices.

(a) Appendix B (B-I, B-II and B-III), WAC 296-62-14537, Appendix C, WAC 296-62-14539 and Appendix D, WAC 296-62-14541 are incorporated as part of this chapter and the contents of these appendices are mandatory.

(b) Appendix A of this chapter, WAC 296-62-14535 contains information which is not intended to create any additional obligations not otherwise imposed or to detract from any existing obligations.

(c) Appendix E of this chapter is a protocol which may be followed in the validation of alternative measuring devices as equivalent to the vertical elutriator cotton dust sampler. Other protocols may be used if it is demonstrated that they are statistically valid, meet the requirements in subsection (4)(a)(iii) of this section, and are appropriate for demonstrating equivalency.

[Statutory Authority: Chapter 49.17 RCW. 87-24-051 (Order 87-24), § 296-62-14533, filed 11/30/87. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-16-009 (Order 86-28), § 296-62-14533, filed 7/25/86; 82-03-023 (Order 82-1), § 296-62-14533, filed 1/15/82. Statutory Authority: 49.17.040, 49.17.050, and 49.17.240. 81-16-015 (Order 81-20), § 296-62-14533, filed 7/27/81. Statutory Authority: RCW 49.17.040, 49.17.050, 49.17.240, chapters 42.30 and 43.22 RCW. 80-17-014 (Order 80-20), § 296-62-14533, filed 11/13/80.]

**WAC 296-62-14535 Appendix A--Air sampling and analytical procedures for determining concentrations of cotton dust.** (1) Sampling locations. The sampling procedures must be designed so that samples of the actual dust concentrations are collected accurately and consistently and reflect the concentrations of dust at the place and time of sampling. Sufficient number of six-hour area samples in each distinct work area of the plant should be collected at locations which provide representative samples of air to which the worker is exposed. In order to avoid filter overloading, sampling time may be shortened when sampling in dusty areas. Samples in each work area should be gathered simultaneously or sequentially during a normal operating period. The daily time-weighted average (TWA) exposure of each worker can then be determined by using the following formula:

$$\frac{\text{Summation of hours spent in each location and the dust concentration in that location.}}{\text{Total hours exposed}}$$

A time-weighted average concentration should be computed for each worker and properly logged and maintained on file for review.

(2) Sampling equipment.

(a) Sampler. The instrument selected for monitoring is the Lumsden-Lynch vertical elutriator. It should operate at a flow rate of  $7.4 \pm 0.2$  liters/minute. The

samplers should be cleaned prior to sampling. The pumps should be monitored during sampling.

(b) Filter holder. A three-piece cassette constructed of polystyrene designed to hold a 37-mm diameter filter should be used. Care must be exercised to insure that an adequate seal exists between elements of the cassette.

(c) Filters and support pads. The membrane filters used should be polyvinyl chloride with a 5- $\mu$ m pore size and 37-mm diameter. A support pad, commonly called a backup pad, should be used under the filter membrane in the field monitor cassette.

(d) Balance. A balance sensitive to 10 micrograms should be used.

(3) Instrument calibration procedure. Samplers shall be calibrated when first received from the factory, after repair, and after receiving any abuse. The samplers should be calibrated in the laboratory both before they are used in the field and after they have been used to collect a large number of field samples. The primary standard, such as a spirometer or other standard calibrating instruments such as a wet test meter or a large bubble meter or dry gas meter, should be used. Instructions for calibration with the wet test meter follow. If another calibration device is selected, equivalent procedures should be used:

(a) Level wet test meter. Check the water level which should just touch the calibration point at the left side of the meter. If water level is low, add water 1-2° F. warmer than room temperature of till point. Run the meter for thirty minutes before calibration;

(b) Place the polyvinyl chloride membrane filter in the filter cassette;

(c) Assemble the calibration sampling train;

(d) Connect the wet test meter to the train.

The pointer on the meter should run clockwise and a pressure drop of not more than 1.0 inch of water indicated. If the pressure drop is greater than 1.0, disconnect and check the system;

(e) Operate the system for ten minutes before starting the calibration;

(f) Check the vacuum gauge on the pump to insure that the pressure drop across the orifice exceeds seven-tenths inches of mercury;

(g) Record the following on calibration data sheets:

(i) Wet test meter reading, start and finish;

(ii) Elapsed time, start and finish (at least two minutes);

(iii) Pressure drop at manometer;

(iv) Air temperature;

(v) Barometric pressure; and

(vi) Limiting orifice number.

(h) Calculate the flow rate and compare against the flow of  $7.4 \pm 0.2$  liters/minute. If flow is between these limits, perform calibration again, average results, and record orifice number and flow rate. If flow is not within these limits, discard or modify orifice and repeat procedure;

(i) Record the name of the person performing the calibration, the date, serial number of the wet test meter, and the number of the critical orifices being calibrated.

(4) Sampling procedure.

(a) Sampling data sheets should include a log of:

(i) The date of the sample collection;

(ii) The time of sampling;

(iii) The location of the sampler;

(iv) The sampler serial number;

(v) The cassette number;

(vi) The time of starting and stopping the sampling and the duration of sampling;

(vii) The weight of the filter before and after sampling;

(viii) The weight of dust collected (corrected for controls);

(ix) The dust concentration measured;

(x) Other pertinent information; and

(xi) Name of person taking sample.

(b) Assembly of filter cassette should be as follows:

(i) Loosely assemble three-piece cassette;

(ii) Number cassette;

(iii) Place absorbent pad in cassette;

(iv) Weigh filter to an accuracy of 10  $\mu$ g;

(v) Place filter in cassette;

(vi) Record weight of filter in log, using cassette number for identification;

(vii) Fully assemble cassette, using pressure to force parts tightly together;

(viii) Install plugs top and bottom;

(ix) Put shrink band on cassette, covering joint between center and bottom parts of cassette; and

(x) Set cassette aside until shrink band dries thoroughly.

(c) Sampling collection should be performed as follows:

(i) Clean lint out of the motor and elutriator;

(ii) Install vertical elutriator in sampling locations specified above with inlet 4-1/2 to 5-1/2 feet from floor (breathing zone height);

(iii) Remove top section of cassette;

(iv) Install cassette in ferrule of elutriator;

(v) Tape cassette to ferrule with masking tape or similar material for air-tight seal;

(vi) Remove bottom plug of cassette and attach hose containing critical orifice;

(vii) Start elutriator pump and check to see if gauge reads above 17 in. of Hg vacuum;

(viii) Record starting time, cassette number, and sampler number;

(ix) At end of sampling period stop pump and record time; and

(x) Controls with each batch of samples collected, two additional filter cassettes should be subjected to exactly the same handling as the samples, except that they are not opened. These control filters should be weighed in the same manner as the sample filters.

Any difference in weight in the control filters would indicate that the procedure for handling sample filters may not be adequate and should be evaluated to ascertain the cause of the difference, whether and what necessary corrections must be made, and whether additional samples must be collected.

(d) Shipping. The cassette with samples should be collected, along with the appropriate number of blanks, and shipped to the analytical laboratory in a suitable container to prevent damage in transit.

(e) Weighing of the sample should be achieved as follows:

(i) Remove shrink band;

(ii) Remove top and middle sections of cassette and bottom plug;

(iii) Remove filter from cassette and weigh to an accuracy of 10  $\mu\text{g}$ ; and

(iv) Record weight in log against original weight.

(f) Calculation of volume of air sampled should be determined as follows:

(i) From starting and stopping times of sampling period, determine length of time in minutes of sampling period; and

(ii) Multiply sampling time in minutes by flow rate of critical orifice in liters per minute and divide by 1000 to find air quantity in cubic meters.

(g) Calculation of dust concentrations should be made as follows:

(i) Subtract weight of clean filter from dirty filter and apply control correction to find actual weight of sample. Record this weight (in  $\mu\text{g}$ ) in log; and

(ii) Divide mass of sample in  $\mu\text{g}$  by air volume in cubic meters to find dust concentration in  $\mu\text{g}/\text{m}$ . Record in log.

[Statutory Authority: RCW 49.17.040, 49.17.050, 49.17.240, chapters 42.30 and 43.22 RCW. 80-17-014 (Order 80-20), § 296-62-14535, filed 11/13/80.]

WAC 296-62-14537 Appendix B-I through B-III--Respiratory questionnaire.

APPENDIX B-I

Respiratory Questionnaire

A. IDENTIFICATION DATA

PLANT \_\_\_\_\_ SOCIAL SECURITY NO. \_\_\_\_\_  
DAY MONTH YEAR  
(figures) (last 2 digits)

NAME \_\_\_\_\_ DATE OF INTERVIEW \_\_\_\_\_  
(Surname)

\_\_\_\_\_  
(First Names) M F

ADDRESS \_\_\_\_\_ AGE \_\_\_\_\_ (8,9) SEX \_\_\_\_\_ (10)  
 \_\_\_\_\_ RACE  W  N  IND.  OTHER (11)

INTERVIEWER: 1 2 3 4 5 6 7 8 (12)

WORK SHIFT: 1st \_\_\_\_\_ 2nd \_\_\_\_\_ 3rd \_\_\_\_\_ (13) STANDING HEIGHT \_\_\_\_\_ (14,15)

PRESENT WORK AREA \_\_\_\_\_ WEIGHT \_\_\_\_\_ (16,18)

If working in more than one specified work area, X area where most of the work shift is spent. If "other," but spending 25% of the work shift in one of the specified work areas, classify in that work area. If carding department employee, check area within that department where most of the work shift is spent (if in doubt, check "throughout"). For work areas such as spinning and weaving where many work rooms may be involved, be sure to check the specific work room to which employee is assigned -- if he works in more than one work room within a department classify as 7 (all) for that department.

	Workroom Number	(19) Open	(20) Pick	(21) Cards Area	(22) Card #1	(23) Card #2	(24) Spin	(25) Wind	(26) Twist	(27) Spool	(28) Warp	(29) Slash	(30) Weave	Other
AT RISK (cotton & cotton blend)	1			Cards										
	2			Draw										
	3			Comb										
	4			Rove										
	5			Thru Out										
	6													
	7 (all)													
Control (synthetic & wool)	8													
Ex-Worker (cotton)	9													

Use actual wording of each question. Put X in appropriate square after each question. When in doubt record 'No'. When no square, circle appropriate answer.

B. COUGH

(on getting up)†
Do you usually cough first thing in the morning? Yes No (31)
(Count a cough with first smoke or on "first going out of doors." Exclude clearing throat or a single cough.)

Do you usually cough during the day or at night? Yes No (32)
(Ignore an occasional cough.)

If 'Yes' to either question (31-32):

Do you cough like this on most days for as much as three months a year? Yes No (33)

Do you cough on any particular day of the week? Yes No (34)

(1) (2) (3) (4) (5) (6) (7)

If 'Yes': Which day? Mon. Tues. Wed.-Thur. Fri. Sat Sun. (35)

C. PHLEGM or alternative word to suit local custom.

(on getting up)†
Do you usually bring up any phlegm from your chest first thing in the morning? Yes No (36)
(Count phlegm with the first smoke or on "first going out of doors." Exclude phlegm from the nose. Count swallowed phlegm.)

Do you usually bring up any phlegm from your chest during the day or at night? Yes No (37)
(Accept twice or more.)

If 'Yes' to either question (36) or (37):

Do you bring up phlegm like this on most days for as much as three months each year? Yes No (38)

If 'Yes' to question (33) or (38):

- (cough)
How long have you had this phlegm? (Write in number of years)
(1) [ ] 2 years or less
(2) [ ] More than 2 years-9 years
(3) [ ] 10-19 years
(4) [ ] 20+ years

†These words are for subjects who work at night

D. CHEST ILLNESSES

- In the past three years, have you had a period of (increased) cough and phlegm lasting for 3 weeks or more? (1) [ ] No (40)
(2) [ ] Yes, only one period
(3) [ ] Yes, two or more periods

†For subjects who usually have phlegm

During the past 3 years have you had any chest illness which has kept you off work, indoors at home or in bed? (For as long as one week, flu?) Yes No (41)

If 'Yes' to (41): Did you bring up (more) phlegm than usual in any of these illnesses? Yes No (42)

If 'Yes' to (42): During the past three years have you had: Only one such illness with increased phlegm? (1) [ ] (43)

More than one such illness: (2) [ ] (44)

Br. Grade \_\_\_\_\_

**E. TIGHTNESS**

Does your chest ever feel tight or your breathing become difficult? \_\_\_\_\_ Yes \_\_\_\_\_ No \_\_\_\_\_ (45)

Is your chest tight or your breathing difficult on any particular day of the week? (after a week or 10 days away from the mill) \_\_\_\_\_ Yes \_\_\_\_\_ No \_\_\_\_\_ (46)

If 'Yes': Which day? Mon. (1) <sup>(3)</sup> Tues. <sup>(4)</sup> Wed. <sup>(5)</sup> Thur. <sup>(6)</sup> Fri. <sup>(7)</sup> Sat. <sup>(8)</sup> Sun. \_\_\_\_\_ (47)

Sometimes Always

If 'Yes' Monday: At what time on Monday does your chest feel tight or your breathing difficult? 1  Before entering the mill \_\_\_\_\_ (48)

2  After entering the mill \_\_\_\_\_

(Ask only if NO to Question (45).)

In the past, has your chest ever been tight or your breathing difficult on any particular day of the week? \_\_\_\_\_ Yes \_\_\_\_\_ No \_\_\_\_\_ (49)

If 'Yes': Which day? Mon. (1) <sup>(3)</sup> Tues. <sup>(4)</sup> Wed. <sup>(5)</sup> Thur. <sup>(6)</sup> Fri. <sup>(7)</sup> Sat. <sup>(8)</sup> Sun. \_\_\_\_\_ (50)

Sometimes Always

**F. BREATHLESSNESS**

If disabled from walking by any condition other than heart or lung disease put "X" here and leave questions (52-60) unasked.  \_\_\_\_\_ (51)

Are you ever troubled by shortness of breath, when hurrying on the level or walking up a slight hill? \_\_\_\_\_ Yes \_\_\_\_\_ No \_\_\_\_\_ (52)

If 'No', grade is 1. If 'Yes' proceed to next question

Do you get short of breath walking with other people at an ordinary pace on the level? \_\_\_\_\_ Yes \_\_\_\_\_ No \_\_\_\_\_ (53)

If 'No', grade is 2. If 'Yes', proceed to next question

Do you have to stop for breath when walking at your own pace on the level? \_\_\_\_\_ Yes \_\_\_\_\_ No \_\_\_\_\_ (54)

If 'No', grade is 3. If 'Yes', proceed to next question

Are you short of breath on washing or dressing? \_\_\_\_\_ Yes \_\_\_\_\_ No \_\_\_\_\_ (55)

If 'No', grade is 4. If 'Yes', grade is 5.

Dyspnea Grd. \_\_\_\_\_ (56)

**ON MONDAYS:**

Are you ever troubled by shortness of breath, when hurrying on the level or walking up a slight hill? \_\_\_\_\_ Yes \_\_\_\_\_ No \_\_\_\_\_ (57)

If 'No', grade is 1. If 'Yes', proceed to next question

Do you get short of breath walking with other people at an ordinary pace on the level? \_\_\_\_\_ Yes \_\_\_\_\_ No \_\_\_\_\_ (58)

If 'No', grade is 2. If 'Yes', proceed to next question

Do you have to stop for breath when walking at your own pace on the level? \_\_\_\_\_ Yes \_\_\_\_\_ No \_\_\_\_\_ (59)

If 'No', grade is 3. If 'Yes', proceed to next question

Are you short of breath on washing or dressing? \_\_\_\_\_ Yes \_\_\_\_\_ No \_\_\_\_\_ (60)

If 'No', grade is 4. If 'Yes', grade is 5

B. Grd. \_\_\_\_\_ (61)



**G. OTHER ILLNESSES AND ALLERGY HISTORY**

Do you have a heart condition for which you are under a doctor's care? Yes \_\_\_\_\_ No \_\_\_\_\_ (62)

Have you ever had asthma? Yes \_\_\_\_\_ No \_\_\_\_\_ (63)

If 'Yes', did it begin: (1)  Before age 30

(2)  After age 30

If 'Yes' before 30: did you have asthma before ever going to work in a textile mill? Yes \_\_\_\_\_ No \_\_\_\_\_ (64)

Have you ever had hay fever or other allergies (other than above)? Yes \_\_\_\_\_ No \_\_\_\_\_ (65)

**H. TOBACCO SMOKING\***

Do you smoke?

Record 'Yes' if regular smoker up to one month ago. (Cigarettes, cigar or pipe) Yes \_\_\_\_\_ No \_\_\_\_\_ (66)

If 'No' to (63).

Have you ever smoked? (Cigarettes, cigars, pipe. Record 'No' if subject has never smoked as much as one cigarette a day, or 1 oz. of tobacco a month, for as long as one year.) Yes \_\_\_\_\_ No \_\_\_\_\_ (67)

If 'Yes' to (63) or (64); what have you smoked and for how many years? (Write in specific number of years in the appropriate square)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	
Years	(<5)	(5-9)	(10-14)	(15-19)	(20-24)	(25-29)	(30-34)	(35-39)	(>40)	
Cigarettes										(68)
Pipe										(69)
Cigars										(70)

If cigarettes, how many packs per day? (Write in number of cigarettes)

- (1)  less than 1/2 pack (71)
- (2)  1/2 pack, but less than 1 pack
- (3)  1 pack, but less than 1-1/2 packs
- (4)  1-1/2 packs or more

Number of pack years: \_\_\_\_\_ (72,73)

If an ex-smoker (cigarettes, cigar or pipe), how long since you stopped? (Write in number of years) \_\_\_\_\_ (74)

- (1)  0-1 year
- (2)  1-4 years
- (3)  5-9 years
- (4)  10+ years

\*Have you changed your smoking habits since last interview? If yes, specify what changes.

**L. OCCUPATIONAL HISTORY\*\***

Have you ever worked in: A foundry? (As long as one year) Yes \_\_\_\_\_ No \_\_\_\_\_ (75)

Stone or mineral mining, quarrying or processing? (As long as one year) Yes \_\_\_\_\_ No \_\_\_\_\_ (76)

Asbestos milling or processing? (Ever) Yes \_\_\_\_\_ No \_\_\_\_\_ (77)

Other dusts, fumes or smoke? If yes, specify: Yes \_\_\_\_\_ No \_\_\_\_\_ (78)

Type of exposure \_\_\_\_\_

Length of exposure \_\_\_\_\_

\*\*Ask only on first interview.

At what age did you first go to work in a textile mill? (Write in specific age in appropriate square).

(1)	(2)	(3)	(4)	(5)	(6)	
<20	20-24	25-29	30-34	35-39	40+	
						(79)

When you first worked in a textile mill, did you work with (1)  Cotton or cotton blend (80)

(2)  Synthetic or wool

APPENDIX B-II

Respiratory Questionnaire for Nontextile Workers for the Cotton Industry

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Identification No.

Interviewer Code

---

Location

Date of Interview

---

A. IDENTIFICATION

1. NAME (Last) (First) (Middle Initial)		3. PHONE NUMBER AREA CODE ( ) NO.	4. SOCIAL SECURITY # (optional see below) <div style="border: 1px solid black; height: 15px; width: 100%;"></div>
2. CURRENT ADDRESS (Number, Street, or Rural Route, City or Town, County, State, Zip Code)		5. BIRTHDATE (Mo., Day, Yr.)	6. AGE LAST BIRTHDAY
		7. SEX  1 <input type="checkbox"/> Male      2 <input type="checkbox"/> Female	
		8. ETHNIC GROUP OR ANCESTRY  1. <input type="checkbox"/> White, not of Hispanic Origin 2. <input type="checkbox"/> Black, not of Hispanic Origin 3. <input type="checkbox"/> Hispanic 4. <input type="checkbox"/> American Indian or Alaskan Native 5. <input type="checkbox"/> Asian or Pacific Islander 6. <input type="checkbox"/> Other: _____	
9. STANDING HEIGHT  _____ (cm)	10. WEIGHT  _____	11. WORK SHIFT  1st <input type="checkbox"/> 2nd <input type="checkbox"/> 3rd <input type="checkbox"/>	
12. PRESENT WORK AREA Please indicate primary assigned work area and percent of time spent at that site. If at other locations, please indicate and note percent of time for each.			
PRIMARY WORK AREA			
SPECIFIC JOB			
13. APPROPRIATE INDUSTRY 1 <input type="checkbox"/> Garnetting                      3 <input type="checkbox"/> Cotton Warehouse                      5 <input type="checkbox"/> Cotton Classification 2 <input type="checkbox"/> Cottonseed Oil Mill                      4 <input type="checkbox"/> Utilization                      6 <input type="checkbox"/> Cotton Ginning			

(Furnishing your Social Security number is voluntary. Your refusal to provide this number will not affect any right, benefit, or privilege to which you would be entitled if you did provide your Social Security number. Your Social Security number is being requested since it will permit use in future determinations in statistical research studies.)



## C. SYMPTOMS

Use actual wording of each question. Put X in appropriate square after each question. When in doubt record "No".

COUGH

1. Do you usually cough first thing in the morning?  
(on getting up)\*  
(Count a cough with first smoke or on  
"first going out of doors". Exclude  
clearing throat or a single cough.) 1  Yes 2  No
2. Do you usually cough during the day or at night?  
(Ignore an occasional cough.) 1  Yes 2  No

If YES to either question 1 or 2:

3. Do you cough like this on most days for as much as  
three months a year? 1  Yes 2  No 9  NA
4. Do you cough on any particular day of the week? 1  Yes 2  No

If YES:

5. Which day? Mon. Tue. Wed. Thur. Fri. Sat. Sun. \_\_\_\_\_

PHLEGM

6. Do you usually bring up any phlegm from your  
chest first thing in the morning? (on getting  
up)\* (Count phlegm with the first smoke or on  
"first going out of doors." Exclude phlegm  
from the nose. Count swallowed phlegm.) 1  Yes 2  No
7. Do you usually bring up any phlegm from your  
chest during the day or at night?  
(Accept twice or more.) 1  Yes 2  No

If YES to either question 6 or 7:

8. Do you bring up phlegm like this on most days  
for as much as three months each year? 1  Yes 2  No

If YES to question 3 or 8:

9. How long have you had this phlegm? (cough)  
(Write in number of years) (1)  2 years or less  
(2)  More than 2 years - 9 years  
(3)  10-19 years  
(4)  20+ years

\*These words are for subjects who work at night



**BREATHLESSNESS**

21. If disabled from walking by any condition other than heart or lung disease put "X" in the space and leave questions (22-30) unasked.
22. Are you ever troubled by shortness of breath, when hurrying on the level or walking up a slight hill? 1  Yes 2  No  
If NO, grade is 1. If YES, proceed to next question
23. Do you get short of breath walking with other people at an ordinary pace on the level? 1  Yes 2  No  
If NO, grade is 2. If YES, proceed to next question
24. Do you have to stop for breath when walking at your own pace on the level? 1  Yes 2  No  
If NO, grade is 3. If YES, proceed to next question
25. Are you short of breath on washing or dressing? 1  Yes 2  No  
If NO, grade is 4. If YES, grade is 5.
26. Dyspnea Grd. \_\_\_\_\_

**ON MONDAYS:**

27. Are you ever troubled by shortness of breath, when hurrying on the level or walking up a slight hill? 1  Yes 2  No  
If NO, grade is 1. If YES, proceed to next question
28. Do you get short of breath walking with other people at an ordinary pace on the level? 1  Yes 2  No  
If NO, grade is 2, If YES, proceed to next question
29. Do you have to stop for breath when walking at your own pace on the level? 1  Yes 2  No  
If NO, grade is 3. If YES, proceed to next question
30. Are you short of breath on washing or dressing? 1  Yes 2  No  
If NO, grade is 4. If YES, grade is 5
31. B. Grd. \_\_\_\_\_

**OTHER ILLNESSES AND ALLERGY HISTORY**

32. Do you have a heart condition for which you are under a doctor's care? 1  Yes 2  No



OTHER ILLNESSES AND ALLERGY HISTORY CONTINUED:

33. Have you ever had asthma? 1  Yes 2  No  
 If yes, did it begin: (1) Before age 30   
 (2) After age 30
34. If yes before 30: did you have asthma before ever going to work in a textile mill? 1  Yes 2  No
35. Have you ever had hay fever or other allergies (other than above)? 1  Yes 2  No

TOBACCO SMOKING

36. Do you smoke? 1  Yes 2  No  
 Record Yes if regular smoker up to one month ago. (Cigarettes, cigar or pipe)

If NO to (33).

37. Have you ever smoked? (Cigarettes, cigars, pipe. Record NO if subject has never smoked as much as one cigarette a day, or 1 oz. of tobacco a month, for as long as one year.) 1  Yes 2  No

If Yes to (33) or (34); what have you smoked for how many years? (Write in specific number of years in the appropriate square)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Years	(<5)	(5-9)	(10-14)	(15-19)	(20-24)	(25-29)	(30-34)	(35-39)	(>40)
38. Cigarettes									
39. Pipe									
40. Cigars									

41. If cigarettes, how many packs per day? Write in number of cigarettes \_\_\_\_\_  
 Less than 1/2 pack  
 1/2 pack, but less than 1 pack  
 1 pack, but less than 1 1/2 packs  
 1-1/2 packs or more
42. Number of pack years: \_\_\_\_\_
43. If an ex-smoker (cigarettes, cigar or pipe), how long since you stopped? (Write in number of years.) \_\_\_\_\_  
 0-1 year  
 1-4 years  
 5-9 years  
 10+ years

## OCCUPATIONAL HISTORY

Have you ever worked in:

44. A foundry? (As long as one year)      1  Yes      2  No
45. Stone or mineral mining, quarrying or  
processing? (As long as one year)      1  Yes      2  No
46. Asbestos milling or processing? (Ever)      1  Yes      2  No
47. Cotton or cotton blend mill? (For controls only)      1  Yes      2  No
48. Other dusts, fumes or smoke? If yes, specify.      1  Yes      2  No

Type of exposure \_\_\_\_\_

Length of exposure \_\_\_\_\_

APPENDIX B III  
Abbreviated Respiratory Questionnaire

A. IDENTIFICATION DATA

PLANT \_\_\_\_\_ SOCIAL SECURITY NO. \_\_\_\_\_  
DAY MONTH YEAR  
(figures) (last 2 digits)

NAME \_\_\_\_\_ DATE OF INTERVIEW \_\_\_\_\_  
(Surname)

\_\_\_\_\_  
(First Names) DATE OF BIRTH \_\_\_\_\_  
M F

ADDRESS \_\_\_\_\_ AGE \_\_\_\_\_ (8,9) SEX \_\_\_\_\_ (10)

RACE  W  N  IND.  OTHER (11)

INTERVIEWER: 1 2 3 4 5 6 7 8 (12)

WORK SHIFT: 1st \_\_\_\_\_ 2nd \_\_\_\_\_ 3rd \_\_\_\_\_ (13) STANDING HEIGHT \_\_\_\_\_ (14,15)

PRESENT WORK AREA \_\_\_\_\_ WEIGHT \_\_\_\_\_ (16,18)

If working in more than one specified work area, X area where most of the work shift is spent. If "other," but spending 25% of the work shift in one of the specified work areas, classify in that work area. If carding department employee, check area within that department where most of the work shift is spent (if in doubt, check "throughout"). For work areas such as spinning and weaving where many work rooms may be involved, be sure to check the specific work room to which employee is assigned - if he works in more than one work room within a department classify as 7 (all) for that department.

	Workroom Number	(19) Open	(20) Pick	(21) Card #1	(22) #2	(23) Spin	(24) Wind	(25) Twist	(26) Spool	(27) Warp	(28) Slash	(29) Weave	(30) Other
AT RISK (cotton & cotton blend)	1			Cards									
	2			Draw									
	3			Comb									
	4			Rove									
	5			Thru Out									
	6												
	7 (all)												
Control (synthetic & wool)	8												
Ex-Worker (cotton)	9												

Use actual wording of each question. Put X in appropriate square after each question. When in doubt record "No." When no square, circle appropriate answer.

B. COUGH

(on getting up)†
Do you usually cough first thing in the morning? Yes No (31)
(Count a cough with first smoke or on "first going out of doors." Exclude clearing throat or a single cough.)

Do you usually cough during the day or at night? Yes No (32)
(Ignore an occasional cough.)

If 'Yes' to either question (31)-(32):

Do you cough like this on most days for as much as three months a year? Yes No (33)

Do you cough on any particular day of the week? Yes No (34)
(1) (2) (3) (4) (5) (6) (7)

If 'Yes': Which day? Mon. Tues. Wed. Thurs. Fri. Sat Sun. (35)

C. PHLEGM or alternative word to suit local custom.

(on getting up)†
Do you usually bring up any phlegm from your chest first thing in the morning? Yes No (36)
(Count phlegm with the first smoke or on "first going out of doors." Exclude phlegm from the nose, Count swallowed phlegm.)

Do you usually bring up any phlegm from your chest during the day or at night? Yes No (37)
(Accept twice or more.)

If 'Yes' to either question (36) or (37):

Do you bring up phlegm like this on most days for as much as three months each year? Yes No (38)

If 'Yes' to question (33) or (39):

How long have you had this (cough) (1) 2 years or less
(Write in number of years) (2) More than 2 years-9 years
(3) 10-19 years
(4) 20+ years

†These words are for subjects who work at night

D. TIGHTNESS

Does your chest ever feel tight or your breathing become difficult? Yes No (39)

Is your chest tight or your breathing difficult on any particular day of the week? Yes No (40)

If 'Yes': Which day? Mon. Tues. Wed. Thurs. Fri. Sat. Sun. (41)
(1) Sometimes (2) Always

If 'Yes' Monday: At what time on Monday does your chest feel tight or your breathing difficult?
1 Before entering the mill (42)
2 After entering the mill

(Ask only if NO to Question (45)†

In the past, has your chest ever been tight or your breathing difficult on any particular day of the week? Yes No (43)

If 'Yes': Which day? Mon. Tues. Wed. Thurs. Fri. Sat. Sun. (44)
(1) Sometimes (2) Always

E. TOBACCO SMOKING\*

\*Have you changed your smoking habits since last interview? If yes specify what changes.

[Statutory Authority: Chapter 49.17 RCW. 87-24-051 (Order 87-24), § 296-62-14537, filed 11/30/87.]





TABLE 3. PREDICTED FVC FOR FEMALES (HUDSON, ET AL; AM RHY RESPIR DIS, 1976, 113, 587.)

HT	AGE									
	17	19	21	23	25	27	29	31	33	35
52.0	2.45	2.64	2.65	2.61	2.56	2.52	2.47	2.43	2.39	2.34
52.5	2.50	2.68	2.70	2.65	2.61	2.57	2.52	2.48	2.43	2.39
53.0	2.54	2.72	2.74	2.70	2.66	2.61	2.57	2.52	2.48	2.44
53.5	2.58	2.76	2.79	2.75	2.70	2.66	2.62	2.57	2.53	2.48
54.0	2.62	2.81	2.84	2.79	2.75	2.71	2.66	2.62	2.57	2.53
54.5	2.66	2.85	2.89	2.84	2.80	2.75	2.71	2.67	2.62	2.58
55.0	2.71	2.89	2.93	2.89	2.84	2.80	2.76	2.71	2.67	2.62
55.5	2.75	2.93	2.98	2.94	2.89	2.85	2.80	2.76	2.72	2.67
56.0	2.79	2.97	3.03	2.98	2.94	2.89	2.85	2.81	2.76	2.72
56.5	2.83	3.01	3.07	3.03	2.99	2.94	2.90	2.85	2.81	2.77
57.0	2.87	3.06	3.12	3.08	3.03	2.99	2.94	2.90	2.86	2.81
57.5	2.91	3.10	3.17	3.12	3.08	3.04	2.99	2.95	2.90	2.86
58.0	2.96	3.14	3.21	3.17	3.13	3.08	3.04	2.99	2.95	2.91
58.5	3.00	3.18	3.26	3.22	3.17	3.13	3.09	3.04	3.00	2.95
59.0	3.04	3.22	3.31	3.26	3.22	3.18	3.13	3.09	3.04	3.00
59.5	3.08	3.27	3.36	3.31	3.27	3.22	3.18	3.14	3.09	3.05
60.0	3.12	3.31	3.40	3.36	3.31	3.27	3.23	3.18	3.14	3.09
60.5	3.17	3.35	3.45	3.41	3.36	3.32	3.27	3.23	3.19	3.14
61.0	3.21	3.39	3.50	3.45	3.41	3.36	3.32	3.28	3.23	3.19
61.5	3.25	3.43	3.54	3.50	3.46	3.41	3.37	3.32	3.28	3.24
62.0	3.29	3.48	3.59	3.55	3.50	3.46	3.41	3.37	3.33	3.29
62.5	3.33	3.52	3.64	3.59	3.55	3.51	3.46	3.42	3.37	3.33
63.0	3.38	3.56	3.68	3.64	3.60	3.55	3.51	3.46	3.42	3.38
63.5	3.42	3.60	3.73	3.69	3.64	3.60	3.56	3.51	3.47	3.42
64.0	3.46	3.64	3.78	3.73	3.69	3.65	3.60	3.56	3.51	3.47
64.5	3.50	3.69	3.83	3.78	3.74	3.69	3.65	3.61	3.56	3.52
65.0	3.54	3.73	3.87	3.83	3.78	3.74	3.70	3.65	3.61	3.56
65.5	3.59	3.77	3.92	3.88	3.83	3.79	3.74	3.70	3.66	3.61
66.0	3.63	3.81	3.97	3.92	3.88	3.83	3.79	3.75	3.70	3.66
66.5	3.67	3.85	4.01	3.97	3.93	3.88	3.84	3.79	3.75	3.71
67.0	3.71	3.89	4.06	4.02	3.97	3.93	3.88	3.84	3.80	3.75
67.5	3.75	3.94	4.11	4.06	4.02	3.98	3.93	3.89	3.84	3.80
68.0	3.79	3.98	4.15	4.11	4.07	4.02	3.98	3.93	3.89	3.85
68.5	3.84	4.02	4.20	4.16	4.11	4.07	4.03	3.98	3.94	3.89
69.0	3.88	4.06	4.25	4.20	4.16	4.12	4.07	4.03	3.98	3.94
69.5	3.92	4.10	4.30	4.25	4.21	4.16	4.12	4.08	4.03	3.99
70.0	3.96	4.15	4.34	4.30	4.25	4.21	4.17	4.12	4.08	4.03
70.5	4.00	4.19	4.39	4.35	4.30	4.26	4.21	4.17	4.13	4.08
71.0	4.05	4.23	4.44	4.39	4.35	4.30	4.26	4.22	4.17	4.13
71.5	4.09	4.27	4.48	4.44	4.40	4.35	4.31	4.26	4.22	4.18
72.0	4.13	4.31	4.53	4.49	4.44	4.40	4.35	4.31	4.27	4.22
72.5	4.17	4.36	4.58	4.53	4.49	4.45	4.40	4.36	4.31	4.27
73.0	4.21	4.40	4.62	4.58	4.54	4.49	4.45	4.40	4.36	4.32
73.5	4.26	4.44	4.67	4.63	4.58	4.54	4.50	4.45	4.41	4.36
74.0	4.30	4.48	4.72	4.67	4.63	4.59	4.54	4.50	4.45	4.41
74.5	4.34	4.52	4.77	4.72	4.68	4.63	4.59	4.55	4.50	4.46
75.0	4.38	4.57	4.81	4.77	4.72	4.68	4.64	4.59	4.55	4.50
75.5	4.42	4.61	4.86	4.82	4.77	4.73	4.68	4.64	4.60	4.55
76.0	4.47	4.65	4.91	4.86	4.82	4.77	4.73	4.69	4.64	4.60
76.5	4.51	4.69	4.95	4.91	4.87	4.82	4.78	4.73	4.69	4.65
77.0	4.55	4.73	5.00	4.96	4.91	4.87	4.82	4.78	4.74	4.69





accumulating volume before (i) the volume change for a 0.5 second interval is less than 25 milliliters or (ii) the flow is less than 50 milliliters per second for a 0.5 second interval.

(i) The forced vital capacity (FVC) and forced expiratory volume in 1 second  $FEV_{1.0}$  measurements shall comply with the accuracy requirements stated in (a) of this subsection. That is, they should be accurately measured to within  $\pm 50$  ml or within  $\pm 3$  percent of reading, whichever is greater.

(j) The instrument must be capable of being calibrated in the field with respect to the  $FEV_1$  and FVC. This calibration of the  $FEV_1$  and FVC may be either directly or indirectly through volume and time base measurements. The volume calibration source should provide a volume displacement of at least 2 liters and should be accurate to within  $\pm 30$  milliliters.

(2) TECHNIQUE FOR MEASUREMENT OF FORCED VITAL CAPACITY MANEUVER.

(a) Use of a nose clip is recommended but not required. The procedures shall be explained in simple terms to the patient who shall be instructed to loosen any tight clothing and stand in front of the apparatus. The subject may sit, but care should be taken on repeat testing that same position be used and, if possible, the same spirometer. Particular attention shall be given to insure that the chin is slightly elevated with the neck slightly extended. The patient shall be instructed to make a full inspiration from a normal breathing pattern and then blow into the apparatus, without interruption, as hard, fast, and completely as possible. At least three forced expirations shall be carried out. During the maneuvers, the patient shall be observed for compliance with instructions. The expirations shall be checked visually for reproducibility from flow-volume or volume-time tracings or displays. The following efforts shall be judged unacceptable when the patient:

(i) Has not reached full inspiration preceding the forced expiration,

(ii) Has not used maximal effort during the entire forced expiration,

(iii) Has not continued the expiration for at least 5 seconds or until an obvious plateau in the volume time curve has occurred,

(iv) Has coughed or closed his glottis,

(v) Has an obstructed mouthpiece or a leak around the mouthpiece (obstruction due to tongue being placed in front of mouthpiece, false teeth falling in front of mouthpiece, etc.),

(vi) Has an unsatisfactory start of expiration, one characterized by excessive hesitation (or false starts), and therefore not allowing back extrapolation of time 0 (extrapolated volume on the volume time tracing must be less than 10 percent of the FVC),

(vii) Has an excessive variability between the three acceptable curves. The variation between the two largest FVC's and  $FEV_1$ 's of the three satisfactory tracings should not exceed 10 percent or  $\pm 100$  milliliters, whichever is greater.

(b) Periodic and routine recalibration of the instrument or method for recording FVC and  $FEV_{1.0}$  should

be performed using a syringe or other volume source of at least 2 liters.

(3) INTERPRETATION OF SPIROGRAM.

(a) The first step in evaluating a spiogram should be to determine whether or not the patient has performed the test properly or as described in subsection (2) of this section. From the three satisfactory tracings, the forced vital capacity (FVC) and forced expiratory volume in 1 second ( $FEV_{1.0}$ ) shall be measured and recorded. The largest observed FVC and largest observed  $FEV_{1.0}$  shall be used in the analysis regardless of the curve(s) on which they occur.

(b) The following guidelines are recommended by NIOSH for the evaluation and management of workers exposed to cotton dust. It is important to note that employees who show reductions in  $FEV_1$ /FVC ratio below .75 or drops in Monday  $FEV_1$  of 5 percent or greater on their initial screening exam, should be reevaluated within a month of the first exam. Those who show consistent decrease in lung function, as shown on the following table, should be managed as recommended.

(4) QUALIFICATIONS OF PERSONNEL ADMINISTERING THE TEST.

Technicians who perform pulmonary function testing should have the basic knowledge required to produce meaningful results. Training consisting of approximately 16 hours of formal instruction should cover the following areas.

(a) Basic physiology of the forced vital capacity maneuver and the determinants of airflow limitation with emphasis on the relation to reproducibility of results.

(b) Instrumentation requirements including calibration procedures, sources of error and their correction.

(c) Performance of the testing including subject coaching, recognition of improperly performed maneuvers and corrective actions.

(d) Data quality with emphasis on reproducibility.

(e) Actual use of the equipment under supervised conditions.

(f) Measurement of tracings and calculations of results.

[Statutory Authority: Chapter 49.17 RCW, 88-14-108 (Order 88-11), § 296-62-14541, filed 7/6/88; 87-24-051 (Order 87-24), § 296-62-14541, filed 11/30/87.]

**WAC 296-62-14543 Appendix E--Vertical elutriator equivalency protocol.** (a) Samples to be taken—In order to ascertain equivalency, it is necessary to collect a total of 100 samples from at least 10 sites in a mill. That is, there should be 10 replicate readings at each of 10 sites. The sites should represent dust levels which vary over the allowable range of 0.5 to 2 times the permissible exposure limit. Each sample requires the use of two vertical elutriators (VE's) and at least one but not more than two alternative devices (AD's). Thus, the end result is 200 VE readings and either 100 or 200 AD readings. The 2 VE readings and the 1 or 2 AD readings at each time and site must be made simultaneously. That is, the two VE's and one or two AD's must be arranged together in such a way that they are measuring essentially the same dust levels.

(b) Data averaging—The two VE readings taken at each site are then averaged. These averages are to be used as the 100 VE readings. If two alternate devices were used, their test results are also averaged. Thus, after this step is accomplished, there will be 100 VE readings and 100 AD readings.

(c) Differences—For each of the 100 sets of measurements (VE and AD) the difference is obtained as the average VE reading minus the AD reading. Call these differences  $D_i$ . Thus, we have.

$$D_i = VE_i - AD_i, i = 1, 2, \dots, 100 \quad (1)$$

Next we compute the arithmetic mean and standard deviations of the differences, using equations (2) and (3), respectively.

$$\bar{X}_D = \frac{1}{N} \sum_{i=1}^N D_i \quad (2)$$

$$S_D = \sqrt{\frac{\sum_{i=1}^N D_i^2 - \frac{(\sum_{i=1}^N D_i)^2}{N}}{N-1}} \quad (3)$$

where  $N$  equals the number of differences (100 in this case),  $\bar{X}_D$  is the arithmetic mean and  $S_D$  is the standard deviation.

We next calculate the critical value as  $T = K S_D + |\bar{X}_D|$  where  $K = 1.87$ , based on 100 samples.

(d) Equivalency test. The next step is to obtain the average of the 100 VE readings. This is obtained by equation (4)

$$\bar{X}_{VE} = \frac{1}{N} \left( \sum_{i=1}^N VE_i \right) \quad (4)$$

We next multiply 0.25 by  $\bar{X}_{VE}$ . If  $T < 0.25 \bar{X}_{VE}$ , we can say that the alternate device has passed the equivalency test.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 86-16-009 (Order 86-28), § 296-62-14543, filed 7/25/86.]

## PART O—COKE OVENS

**WAC 296-62-200 Coke oven emissions.** Scope and application. This section applies to the control of employee exposure to coke oven emissions.

[Order 77-14, § 296-62-200, filed 7/25/77.]

**WAC 296-62-20001 Definitions.** For the purpose of this section:

(1) "Authorized person." Any person specifically authorized by the employer whose duties require the person to enter a regulated area, or any person entering such an area as a designated representative of employees for the purpose of exercising the opportunity to observe

monitoring and measuring procedures under WAC 296-62-20025.

(2) "Beehive oven." A coke oven in which the products of carbonization other than coke are not recovered, but are released into the ambient air.

(3) "Coke oven." A retort in which coke is produced by the destructive distillation or carbonization of coal.

(4) "Coke oven battery." A structure containing a number of slot-type coke ovens.

(5) "Coke oven emissions." The benzenesoluble fraction of total particulate matter present during the destructive distillation or carbonization of coal for the production of coke.

(6) "Director." The director of the department of labor and industries or his or her authorized representative.

(7) "Emergency." Any occurrence such as, but not limited to, equipment failure which is likely to, or does, result in any massive release of coke oven emissions.

(8) "Existing coke oven battery." A battery in operation or under construction on January 20, 1977, and which is not rehabilitated.

(9) "Rehabilitated coke oven battery." A battery which is rebuilt, overhauled, renovated, or restored such as from the pad up, after January 20, 1977.

(10) "Stage charging." A procedure by which a predetermined volume of coal in each larry car hopper is introduced into an oven such that no more than two hoppers are discharging simultaneously.

(11) "Sequential charging." A procedure, usually automatically timed, by which a predetermined volume of coal in each larry car hopper is introduced into an oven such that no more than two hoppers commence or finish discharging simultaneously although, at some point, all hoppers are discharging simultaneously.

(12) "Pipeline charging." Any apparatus used to introduce coal into an oven which uses a pipe or duct permanently mounted onto an oven and through which coal is charged.

(13) "Green push." Coke which when removed from the oven results in emissions due to the presence of unvolatilized coal.

[Order 77-14, § 296-62-20001, filed 7/25/77.]

**WAC 296-62-20003 Permissible exposure limit.** The employer shall assure that no employee is exposed to coke oven emissions at concentrations greater than 150 micrograms per cubic meter of air (150  $\mu\text{g}/\text{m}^3$ ), averaged over any 8-hour period.

[Order 77-14, § 296-62-20003, filed 7/25/77.]

**WAC 296-62-20005 Regulated areas.** (1) The employer shall establish regulated areas and shall limit access to them to authorized persons.

(2) The employer shall establish the following as regulated areas:

(a) The coke oven battery including topside and its machinery, pushside and its machinery, coke side and its machinery, and the battery ends; the wharf; and the screening station;

(b) The beehive oven and its machinery.

[Order 77-14, § 296-62-20005, filed 7/25/77.]

**WAC 296-62-20007 Exposure monitoring and measurement.** (1) Monitoring program.

(a) Each employer who has a place of employment where coke oven emissions are present shall monitor employees employed in the regulated area to measure their exposure to coke oven emissions.

(b) The employer shall obtain measurements which are representative of each employee's exposure to coke oven emissions over an eight-hour period. All measurements shall determine exposure without regard to the use of respiratory protection.

(c) The employer shall collect full-shift (for at least seven continuous hours) personal samples, including at least one sample during each shift for each battery and each job classification within the regulated areas including at least the following job classifications:

- (i) Lidman;
- (ii) Tar chaser;
- (iii) Larry car operator;
- (iv) Luterman;
- (v) Machine operator, coke side;
- (vi) Benchman, coke side;
- (vii) Benchman, pusher side;
- (viii) Heater;
- (ix) Quenching car operator;
- (x) Pusher machine operator;
- (xi) Screening station operator;
- (xii) Wharfman;
- (xiii) Oven patcher;
- (xiv) Oven repairman;
- (xv) Spellman; and
- (xvi) Maintenance personnel.

(d) The employer shall repeat the monitoring and measurements required by subsection (1) of this section at least every three months.

(2) Redetermination. Whenever there has been a production, process, or control change which may result in new or additional exposure to coke oven emissions, or whenever the employer has any other reason to suspect an increase in employee exposure, the employer shall repeat the monitoring and measurements required by subsection (1) of this section for those employees affected by such change or increase.

(3) Employee notification.

(a) The employer shall notify each employee in writing of the exposure measurements which represent that employee's exposure within five working days after the receipt of the results of measurements required by subsection (1) and (2) of this section.

(b) Whenever such results indicate that the representative employee exposure exceeds the permissible exposure limit, the employer shall, in such notification, inform each employee of that fact and of the corrective action being taken to reduce exposure to or below the permissible exposure limit.

(4) Accuracy of measurement. The employer shall use a method of monitoring and measurement which has an accuracy (with a confidence level of 95%) of not less

than plus or minus 35% for concentrations of coke oven emissions greater than or equal to 150 U<sub>g</sub>/m<sup>3</sup>.

[Order 77-14, § 296-62-20007, filed 7/25/77.]

**WAC 296-62-20009 Methods of compliance.** The employer shall control employee exposure to coke oven emissions by the use of engineering controls, work practices and respiratory protection as follows:

(1) Priority of compliance methods.

(a) Existing coke oven batteries.

(i) The employer shall institute the engineering and work practice controls listed in subsections (2), (3) and (4) of this section in existing coke oven batteries at the earliest possible time, but not later than January 20, 1980, except to the extent that the employer can establish that such controls are not feasible. In determining the earliest possible time for institution of engineering and work practice controls, the requirement, effective August 27, 1971, to implement feasible administrative or engineering controls to reduce exposures to coal tar pitch volatiles, shall be considered. Wherever the engineering and work practice controls which can be instituted are not sufficient to reduce employee exposures to or below the permissible exposure limit, the employer shall nonetheless use them to reduce exposures to the lowest level achievable by these controls and shall supplement them by the use of respiratory protection which complies with the requirements of WAC 296-62-20011.

(ii) The engineering and work practice controls required under subsections (2), (3) and (4) of this section are minimum requirements generally applicable to all existing coke oven batteries. If, after implementing all controls required by subsections (2), (3) and (4) of this section, or after January 20, 1980, whichever is sooner, employee exposures still exceed the permissible exposure limit, employers shall implement any other engineering and work practice controls necessary to reduce exposure to or below the permissible exposure limit except to the extent that the employer can establish that such controls are not feasible. Whenever the engineering and work practice controls which can be instituted are not sufficient to reduce employee exposures to or below the permissible exposure limit, the employer shall nonetheless use them to reduce exposures to the lowest level achievable by these controls and shall supplement them by the use of respiratory protection which complies with the requirements of WAC 296-62-20011.

(b) New or rehabilitated coke oven batteries.

(i) The employer shall institute the best available engineering and work practice controls on all new or rehabilitated coke oven batteries to reduce and maintain employee exposures at or below the permissible exposure limit, except to the extent that the employer can establish that such controls are not feasible. Wherever the engineering and work practice controls which can be instituted are not sufficient to reduce employee exposures to or below the permissible exposure limit, the employer shall nonetheless use them to reduce exposures to the lowest level achievable by these controls and shall supplement them by the use of respiratory protection which complies with the requirements of WAC 296-62-20011.

(ii) If, after implementing all the engineering and work practice controls required by (b)(i) of this subsection, employee exposures still exceed the permissible exposure limit, the employer shall implement any other engineering and work practice controls necessary to reduce exposure to or below the permissible exposure limit except to the extent that the employer can establish that such controls are not feasible. Wherever the engineering and work practice controls which can be instituted are not sufficient to reduce employee exposures to or below the permissible exposure limit, the employer shall nonetheless use them to reduce exposures to the lowest level achievable by these controls and shall supplement them by the use of respiratory protection which complies with the requirements of WAC 296-62-20011.

(c) Beehive ovens.

(i) The employer shall institute engineering and work practice controls on all beehive ovens at the earliest possible time to reduce and maintain employee exposures at or below the permissible exposure limit, except to the extent that the employer can establish that such controls are not feasible. In determining the earliest possible time for institution of engineering and work practice controls, the requirement, effective August 27, 1971, to implement feasible administrative or engineering controls to reduce exposures to coal tar pitch volatiles, shall be considered. Wherever the engineering and work practice controls which can be instituted are not sufficient to reduce employee exposures to or below the permissible exposure limit, the employer shall nonetheless use them to reduce exposures to the lowest level achievable by these controls and shall supplement them by the use of respiratory protection which complies with the requirements of WAC 296-62-20011.

(ii) If, after implementing all engineering and work practice controls required by (c)(i) of this subsection, employee exposures still exceed the permissible exposure limit, the employer shall implement any other engineering and work practice controls necessary to reduce exposures to or below the permissible exposure limit except to the extent that the employer can establish that such controls are not feasible. Whenever the engineering and work practice controls which can be instituted are not sufficient to reduce employee exposures to or below the permissible exposure limit, the employer shall nonetheless use them to reduce exposures to the lowest level achievable by these controls and shall supplement them by the use of respiratory protection which complies with the requirements of WAC 296-62-20011.

(2) Engineering controls.

(a) Charging. The employer shall equip and operate existing coke oven batteries with all of the following engineering controls to control coke oven emissions during charging operations:

(i) One of the following methods of charging:

(A) Stage charging as described in subsection (3)(a)(ii) of this section; or

(B) Sequential charging as described in subsection (3)(a)(ii) of this section except that subsection (3)(a)(ii) and (3)(d) of this section does not apply to sequential charging; or

(C) Pipeline charging or other forms of enclosed charging in accordance with (a) of this subsection, except (a)(ii), (iv), (v), (vi) and (viii) of this subsection do not apply.

(ii) Drafting from two or more points in the oven being charged, through the use of double collector mains, or a fixed or moveable jumper pipe system to another oven, to effectively remove the gases from the oven to the collector mains;

(iii) Aspiration systems designed and operated to provide sufficient negative pressure and flow volume to effectively move the gases evolved during charging into the collector mains, including sufficient steam pressure, and steam jets of sufficient diameter;

(iv) Mechanical volumetric controls on each larry car hopper to provide the proper amount of coal to be charged through each charging hole so that the tunnel head will be sufficient to permit the gases to move from the oven into the collector mains;

(v) Devices to facilitate the rapid and continuous flow of coal into the oven being charged, such as stainless steel liners, coal vibrators or pneumatic shells;

(vi) Individually operated larry car drop sleeves and slide gates designed and maintained so that the gases are effectively removed from the oven into the collector mains;

(vii) Mechanized gooseneck and standpipe cleaners;

(viii) Air seals on the pusher machine leveler bars to control air infiltration during charging; and

(ix) Roof carbon cutters or a compressed air system or both on the pusher machine rams to remove roof carbon.

(b) Coking. The employer shall equip and operate existing coke oven batteries with all of the following engineering controls to control coke oven emissions during coking operations:

(i) A pressure control system on each battery to obtain uniform collector main pressure;

(ii) Ready access to door repair facilities capable of prompt and efficient repair of doors, door sealing edges and all door parts;

(iii) An adequate number of spare doors available for replacement purposes;

(iv) Chuck door gaskets to control chuck door emissions until such door is repaired, or replaced; and

(v) Heat shields on door machines.

(3) Work practice controls.

(a) Charging. The employer shall operate existing coke oven batteries with all of the following work practices to control coke oven emissions during the charging operation:

(i) Establishment and implementation of a detailed, written inspection and cleaning procedure for each battery consisting of at least the following elements:

(A) Prompt and effective repair or replacement of all engineering controls;

(B) Inspection and cleaning of goosenecks and standpipes prior to each charge to a specified minimum diameter sufficient to effectively move the evolved gases from the oven to the collector mains;

(C) Inspection for roof carbon build-up prior to each charge and removal of roof carbon as necessary to provide an adequate gas channel so that the gases are effectively moved from the oven into the collector mains;

(D) Inspection of the steam aspiration system prior to each charge so that sufficient pressure and volume is maintained to effectively move the gases from the oven to the collector mains;

(E) Inspection of steam nozzles and liquor sprays prior to each charge and cleaning as necessary so that the steam nozzles and liquor sprays are clean;

(F) Inspection of standpipe caps prior to each charge and cleaning and luting or both as necessary so that the gases are effectively moved from the oven to the collector mains; and

(G) Inspection of charging holes and lids for cracks, warpage and other defects prior to each charge and removal of carbon to prevent emissions, and application of luting material to standpipe and charging hole lids where necessary to obtain a proper seal.

(ii) Establishment and implementation of a detailed written charging procedure, designed and operated to eliminate emissions during charging for each battery, consisting of at least the following elements:

(A) Larry car hoppers filled with coal to a predetermined level in accordance with the mechanical volumetric controls required under subsection (2)(a)(iv) of this section so as to maintain a sufficient gas passage in the oven to be charged;

(B) The larry car aligned over the oven to be charged, so that the drop sleeves fit tightly over the charging holes; and

(C) The oven charged in accordance with the following sequence of requirements:

(I) The aspiration system turned on;

(II) Coal charged through the outermost hoppers, either individually or together, depending on the capacity of the aspiration system to collect the gases involved;

(III) The charging holes used under (a)(ii) and (b) of this subsection relidded or otherwise sealed off to prevent leakage of coke oven emissions;

(IV) If four hoppers are used, the third hopper discharged and relidded or otherwise sealed off to prevent leakage of coke oven emissions;

(V) The final hopper discharged until the gas channel at the top of the oven is blocked and then the chuck door opened and the coal leveled;

(VI) When the coal from the final hopper is discharged and the leveling operation complete, the charging hole relidded or otherwise sealed off to prevent leakage of coke oven emissions; and

(VII) The aspiration system turned off only after the charging holes have been closed.

(VIII) Establishment and implementation of a detailed written charging procedure, designed and operated to eliminate emissions during charging of each pipeline or enclosed charged battery.

(b) Coking. The employer shall operate existing coke oven batteries pursuant to a detailed written procedure established and implemented for the control of coke oven

emissions during coking, consisting of at least the following elements:

(i) Checking oven back pressure controls to maintain uniform pressure conditions in the collecting main;

(ii) Repair, replacement and adjustment of oven doors and check doors and replacement of door jambs so as to provide a continuous metal-to-metal fit;

(iii) Cleaning of oven doors, chuck doors and door jambs each coking cycle so as to provide an effective seal;

(iv) An inspection system and corrective action program to control door emissions to the maximum extent possible; and

(v) Luting of doors that are sealed by luting each coking cycle and reluting, replacing or adjusting as necessary to control leakage.

(c) Pushing. The employer shall operate existing coke oven batteries with the following work practices to control coke oven emissions during pushing operations:

(i) Coke and coal spillage quenched as soon as practicable and not shoveled into a heated oven; and

(ii) A detailed written procedure for each battery established and implemented for the control of emissions during pushing consisting of the following elements:

(A) Dampering off the ovens and removal of charging hole lids to effectively control coke oven emissions during the push;

(B) Heating of the coal charge uniformly for a sufficient period so as to obtain proper coking including preventing green pushes;

(C) Prevention of green pushes to the maximum extent possible;

(D) Inspection, adjustment and correction of heating flue temperatures and defective flues at least weekly and after any green push, so as to prevent green pushes;

(E) Cleaning of heating flues and related equipment to prevent green pushes, at least weekly and after any green push.

(d) Maintenance and repair. The employer shall operate existing coke oven batteries pursuant to a detailed written procedure of maintenance and repair established and implemented for the effective control of coke oven emissions consisting of the following elements:

(i) Regular inspection of all controls, including goosenecks, standpipes, standpipe caps, charging hole lids and castings, jumper pipes and air seals for cracks, misalignment or other defects and prompt implementation of the necessary repairs as soon as possible;

(ii) Maintaining the regulated area in a neat, orderly condition free of coal and coke spillage and debris;

(iii) Regular inspection of the damper system, aspiration system and collector main for cracks or leakage, and prompt implementation of the necessary repairs;

(iv) Regular inspection of the heating system and prompt implementation of the necessary repairs;

(v) Prevention of miscellaneous fugitive topside emissions;

(vi) Regular inspection and patching of over brickwork;

(vii) Maintenance of battery equipment and controls in good working order;



(viii) Maintenance and repair of coke oven doors, chuck doors, door jambs and seals; and

(ix) Repairs instituted and completed as soon as possible, including temporary repair measures instituted and completed where necessary, including but not limited to:

(A) Prevention of miscellaneous fugitive topside emissions; and

(B) Chuck door gaskets, which shall be installed prior to the start of the next coking cycle.

(4) Filtered air.

(a) The employer shall provide positive-pressure, temperature controlled filtered air for larry car, pusher machine, door machine, and quench car cabs.

(b) The employer shall provide standby pulpits on the battery topside, at the wharf, and at the screening station, equipped with positive-pressure, temperature controlled filtered air.

(5) Emergencies. Whenever an emergency occurs, the next coking cycle may not begin until the cause of the emergency is determined and corrected, unless the employer can establish that it is necessary to initiate the next coking cycle in order to determine the cause of the emergency.

(6) Compliance program.

(a) Each employer shall establish and implement a written program to reduce exposures solely by means of the engineering and work practice controls specified in subsections (2) through (4) of this section.

(b) The written program shall include at least the following:

(i) A description of each coke oven operation by battery, including work force and operating crew, coking time, operating procedures and maintenance practices;

(ii) Engineering plans and other studies used to determine the controls for the coke battery;

(iii) A report of the technology considered in meeting the permissible exposure limit;

(iv) Monitoring data obtained in accordance with WAC 296-62-20007.

(v) A detailed schedule for the implementation of the engineering and work practice controls specified in subsections (2) through (4) of this section; and

(vi) Other relevant information.

(c) If, after implementing all controls required by subsections (2) through (4) of this section, or after January 20, 1980, whichever is sooner, or after completion of a new or rehabilitated battery the permissible exposure limit is still exceeded, the employer shall develop a detailed written program and schedule for the implementation of any additional engineering controls and work practices necessary to reduce exposure to or below the permissible exposure limit.

(d) Written plans for such programs shall be submitted, upon request, to the director, and shall be available at the worksite for examination and copying by the director, and the authorized employee representative. The plans required under this subsection shall be revised and updated at least every six months to reflect the current status of the program.

(7) Training in compliance procedures. The employer shall incorporate all written procedures and schedules required under this section in the education and training program required under WAC 296-62-20019 and, where appropriate, post in the regulated area.

[Statutory Authority: Chapter 49.17 RCW. 88-23-054 (Order 88-25), § 296-62-20009, filed 11/14/88. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-16-009 (Order 86-28), § 296-62-20009, filed 7/25/86; Order 77-14, § 296-62-20009, filed 7/25/77.]

#### WAC 296-62-20011 Respiratory protection. (1) General.

(a) Where respiratory protection is required under this section, the employer shall provide and assure the use of respirators which comply with the requirements of this section. Compliance with the permissible limit exposure may not be achieved by the use of respirators except:

(i) During the time period necessary to install or implement feasible engineering and work practice controls; or

(ii) In work operations such as maintenance and repair activity in which engineering and work practice controls are technologically not feasible; or

(iii) In work situations where feasible engineering and work practice controls are not yet sufficient to reduce exposure to or below the permissible exposure limit; or

(iv) In emergencies.

(b) Notwithstanding any other requirement of this section, until January 20, 1978, the wearing of respirators shall be at the discretion of each employee where the employee is not in the vicinity of visible emissions.

(2) Selection.

(a) Where respirators are required under this section, the employer shall select, provide and assure the use of the appropriate respirator or combination of respirators from Table I below.

TABLE I

#### RESPIRATORY PROTECTION FOR COKE OVEN EMISSIONS

Airborne concentration of coke oven emissions	Required respirator
(i) Any concentration.	(A) A Type C supplied air respirator operated in pressure demand or other positive pressure or continuous flow mode; or (B) A powered air-purifying particulate filter respirator for dust, mist, and fume; or (C) A powered air-purifying particulate filter respirator combination chemical cartridge and particulate filter respirator for coke oven emissions.
(ii) Concentrations not greater than 1500 $\mu\text{g}/\text{m}^3$ .	(A) Any particulate filter respirator for dust, mist and fume, except single-use respirator; or

TABLE I  
RESPIRATORY PROTECTION FOR COKE  
OVEN EMISSIONS

Airborne concentration of coke oven emissions	Required respirator
	(B) Any particulate filter respirator or combination chemical cartridge and particulate filter respirator for coke oven emissions; or
	(C) Any respirator listed in subsection (2)(a)(i) of this section.

(b) Not later than January 20, 1978, whenever respirators are required by this section for concentrations not greater than 1500  $\mu\text{g}/\text{m}^3$ , the employer shall provide, at the option of each affected employee, either a particulate filter respirator as provided in subsection (2)(a)(ii) of this section, or a powered air purifying respirator as provided in subsection (2)(a)(i) of this section.

(c) The employer shall select respirators from among those approved for protection against dust, fume, and mist by the National Institute for Occupational Safety and Health (NIOSH) under the provisions of 30 CFR Part 11, except that not later than January 20, 1979, the employer shall select respirators from among those approved by NIOSH for protection against coke oven emissions.

(3) Respirator program. The employer shall institute a respiratory protection program in accordance with WAC 296-62-071.

(4) Respirator usage.

(a) The employer shall assure that the respirator issued to the employee exhibits minimum facepiece leakage and that the respirator is fitted properly.

(b) The employer shall allow each employee who uses a filter respirator to change the filter elements whenever an increase in breathing resistance is detected and shall maintain an adequate supply of filter elements for this purpose.

(c) The employer shall allow employees who wear respirators to wash their face and respirator facepiece to prevent skin irritation associated with respirator use.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 86-16-009 (Order 86-28), § 296-62-20011, filed 7/25/86. Statutory Authority: 49.17.040, 49.17.050, and 49.17.240. 81-16-015 (Order 81-20), § 296-62-20011, filed 7/27/81; Order 77-14, § 296-62-20011, filed 7/25/77.]

**WAC 296-62-20013 Protective clothing and equipment.** (1) Provision and Use. The employer shall provide and assure the use of appropriate protective clothing and equipment, such as but not limited to:

- (a) Flame resistant jacket and pants;
- (b) Flame resistant gloves;
- (c) Face shields or vented goggles which comply with WAC 296-24-078;
- (d) Footwear providing insulation from hot surfaces;
- (e) Safety shoes which comply with WAC 296-24-088; and

(1989 Ed.)

(f) Protective helmets which comply with WAC 296-24-084.

(2) Cleaning and Replacement.

(a) The employer shall provide the protective clothing required by subsection (1)(a) and (b) of this section in a clean and dry condition at least weekly.

(b) The employer shall clean, launder, or dispose of protective clothing required by subsections (1)(a) and (b) of this section.

(c) The employer shall repair or replace the protective clothing and equipment as needed to maintain their effectiveness.

(d) The employer shall assure that all protective clothing is removed at the completion of a work shift only in change rooms prescribed in WAC 296-62-20015.

(e) The employer shall assure that contaminated protective clothing which is to be cleaned, laundered, or disposed of, is placed in a closed container in the changeroom.

(f) The employer shall inform any person who cleans or launders protective clothing required by this section, of the potentially harmful effects of exposure to coke oven emissions.

[Order 77-14, § 296-62-20013, filed 7/25/77.]

**WAC 296-62-20015 Hygiene facilities and practices.** (1) Change rooms. The employer shall provide clean change rooms equipped with storage facilities for street clothes and separate storage facilities for protective clothing and equipment whenever employees are required to wear protective clothing and equipment in accordance with WAC 296-62-20013.

(2) Showers.

(a) The employer shall assure that employees working in the regulated area shower at the end of the work shift.

(b) The employer shall provide shower facilities in accordance with WAC 296-24-12009.

(3) Lunchrooms. The employer shall provide lunchroom facilities which have a temperature controlled, positive pressure, filtered air supply, and which are readily accessible to employees working in the regulated area.

(4) Lavatories.

(a) The employer shall assure that employees working in the regulated area wash their hands and face prior to eating.

(b) The employer shall provide lavatory facilities in accordance with WAC 296-24-12007.

(5) Prohibition of activities in the regulated area.

(a) The employer shall assure that in the regulated area, food or beverages are not present or consumed, smoking products are not present or used, and cosmetics are not applied, except, that these activities may be conducted in the lunchrooms, change rooms and showers required under subsection (1)-(3) of this section.

(b) Drinking water may be consumed in the regulated area.

[Order 77-14, § 296-62-20015, filed 7/25/77.]

[Title 296 WAC—p 1627]



**WAC 296-62-20017 Medical surveillance.** (1) General requirements.

(a) Each employer shall institute a medical surveillance program for all employees who are employed in the regulated areas at least 30 days per year.

(b) This program shall provide each employee covered under subsection (1)(a) of this section with an opportunity for medical examinations in accordance with this section.

(c) The employer shall inform any employee who refuses any required medical examination of the possible health consequences of such refusal and shall obtain a signed statement from the employee indicating that the employee understands the risk involved in the refusal to be examined.

(d) The employer shall assure that all medical examinations and procedures are performed by or under the supervision of a licensed physician, and are provided without cost to the employee.

(2) Initial examinations. At the time of initial assignment to a regulated area or upon the institution of the medical surveillance program, the employer shall provide a medical examination including at least the following elements:

(a) A work history and medical history which shall include smoking history and the presence and degree of respiratory symptoms, such as breathlessness, cough, sputum production, and wheezing;

(b) A 14" x 17" posterior-anterior chest x-ray and International Labour Office UICC/Cincinnati (ILO U/C) rating;

(c) Pulmonary function tests including forced vital capacity (FVC) and forced expiratory volume at one second (FEV 1.0) with recording of type of equipment used;

(d) Weight;

(e) A skin examination;

(f) Urinalysis for sugar, albumin, and hematuria;

(g) A sputum cytology examination; and

(h) A urinary cytology examination.

(3) Periodic examinations.

(a) The employer shall provide the examinations specified in subsections (2)(a)-(f) of this section at least annually for employees covered under subsection (1)(a) of this section.

(b) The employer shall provide the examinations specified in subsection (2)(a)-(h) of this section at least semi-annually for employees 45 years of age or older or with five or more years employment in the regulated area.

(c) Whenever an employee who is 45 years of age or older or with five or more years employment in the regulated area transfers or is transferred from employment in a regulated area, the employer shall continue to provide the examinations specified in subsections (2)(a)-(h) of this section semi-annually, as long as that employee is employed by the same employer or a successor employer.

(d) Whenever an employee has not taken the examination specified in subsections (3)(a)-(c) of this section

within the six months preceding the termination of employment, the employer shall provide such examinations to the employee upon termination of employment.

(4) Information provided to the physician. The employer shall provide the following information to the examining physician:

(a) A copy of this regulation and its Appendixes;

(b) A description of the affected employee's duties as they relate to the employee's exposure;

(c) The employee's exposure level or anticipated exposure level;

(d) A description of any personal protective equipment used or to be used; and

(e) Information from previous medical examinations of the affected employee which is not readily available to the examining physician.

(5) Physician's written opinion.

(a) The employer shall obtain a written opinion from the examining physician which shall include:

(i) The results of the medical examinations;

(ii) The physician's opinion as to whether the employee has any detected medical conditions which would place the employee at increased risk of material impairment of the employee's health from exposure to coke oven emissions;

(iii) Any recommended limitations upon the employee's exposure to coke oven emissions or upon the use of protective clothing or equipment such as respirators; and

(iv) A statement that the employee has been informed by the physician of the results of the medical examination and any medical conditions which require further explanation or treatment.

(b) The employer shall instruct the physician not to reveal in the written opinion specific findings or diagnoses unrelated to occupational exposure.

(c) The employer shall provide a copy of the written opinion to the affected employee.

[Order 77-14, § 296-62-20017, filed 7/25/77.]

**WAC 296-62-20019 Employee information and training.** (1) Training program.

(a) The employer shall institute a training program for employees who are employed in the regulated area and shall assure their participation.

(b) The training program shall be provided as of January 20, 1977, for employees who are employed in the regulated area at that time or at the time of initial assignment to a regulated area.

(c) The training program shall be provided at least annually for all employees who are employed in the regulated area, except that training regarding the occupational safety and health hazards associated with exposure to coke oven emissions and the purpose, proper use, and limitations of respiratory protective devices shall be provided at least quarterly until January 20, 1978.

(d) The training program shall include informing each employee of:

(i) The information contained in the substance information sheet for coke oven emissions (Appendix A);

(ii) The purpose, proper use, and limitations of respiratory protective devices required in accordance with WAC 296-62-20011.

(iii) The purpose for and a description of the medical surveillance program required by WAC 296-62-20017 including information on the occupational safety and health hazards associated with exposure to coke oven emissions;

(iv) A review of all written procedures and schedules required under WAC 296-62-20009; and

(v) A review of this standard.

(2) Access to training materials.

(a) The employer shall make a copy of this standard and its appendixes readily available to all employees who are employed in the regulated area.

(b) The employer shall provide all materials relating to the employee information and training program to the director.

[Order 77-14, § 296-62-20019, filed 7/25/77.]

#### WAC 296-62-20021 Precautionary signs and labels.

(1) General.

(a) The employer may use labels or signs required by other statutes, regulations or ordinances in addition to, or in combination with, signs and labels required by this section.

(b) The employer shall assure that no statement appears on or near any sign required by this section which contradicts or detracts from the effects of the required sign.

(c) The employer shall assure that signs required by this section are illuminated and cleaned as necessary so that the legend is readily visible.

(2) Signs.

(a) The employer shall post signs in the regulated area bearing the legends:

DANGER

CANCER HAZARD

AUTHORIZED PERSONNEL ONLY

NO SMOKING OR EATING

(b) In addition, not later than January 20, 1978, the employer shall post signs in the areas where the permissible exposure limit is exceeded bearing the legend:

RESPIRATOR REQUIRED

(3) Labels. The employer shall apply precautionary labels to all containers of protective clothing contaminated with coke oven emissions. The label shall bear the following legend:

CAUTION

CLOTHING CONTAMINATED WITH COKE

EMISSIONS

DO NOT REMOVE DUST BY BLOWING OR SHAKING

[Order 77-14, § 296-62-20021, filed 7/25/77.]

(1989 Ed.)

WAC 296-62-20023 Recordkeeping. (1) Exposure measurements. The employer shall establish and maintain an accurate record of all measurements taken to monitor employee exposure to coke oven emissions required in WAC 296-62-20007.

(a) This record shall include:

(i) Name, social security number, and job classification of the employees monitored;

(ii) The date(s), number, duration and results of each of the samples taken, including a description of the sampling procedure used to determine representative employee exposure where applicable;

(iii) The type of respiratory protective devices worn, if any;

(iv) A description of the sampling and analytical methods used and evidence of their accuracy; and

(v) The environment variables that could affect the measurement of employee exposure.

(b) The employer shall maintain this record for at least 40 years or for the duration of employment plus 20 years, whichever is longer.

(2) Medical surveillance. The employer shall establish and maintain an accurate record for each employee subject to medical surveillance as required by WAC 296-62-20017.

(a) The record shall include:

(i) The name, social security number, and description of duties of the employee;

(ii) A copy of the physician's written opinion;

(iii) The signed statement of any refusal to take a medical examination under WAC 296-62-20017; and

(iv) Any employee medical complaints related to exposure to coke oven emissions.

(b) The employer shall keep, or assure that the examining physician keeps, the following medical records:

(i) A copy of the medical examination results including medical and work history required under WAC 296-62-20017;

(ii) A description of the laboratory procedures used and a copy of any standards or guidelines used to interpret the test results;

(iii) The initial x-ray;

(iv) The x-rays for the most recent 5 years;

(v) Any x-ray with a demonstrated abnormality and all subsequent x-rays;

(vi) The initial cytologic examination slide and written description;

(vii) The cytologic examination slide and written description for the most recent 10 years; and

(viii) Any cytologic examination slides with demonstrated atypia, if such atypia persists for 3 years, and all subsequent slides and written descriptions.

(c) The employer shall maintain medical records required under subsection (2) of this section for at least 40 years, or for the duration of employment plus 20 years, whichever is longer.

(3) Availability.

(a) The employer shall make available upon request all records required to be maintained by this section to the director for examination and copying.

[Title 296 WAC—p 1629]

(b) Employee exposure measurement records and employee medical records required by this subsection shall be provided upon request to employees, designated representatives, and the assistant director in accordance with WAC 296-62-05201 through 296-62-05209 and 296-62-05213 through 296-62-05217.

(c) The employer shall make available upon request employee medical records required to be maintained by subsection (2) of this section to a physician designated by the affected employee or former employee.

(4) Transfer of records.

(a) Whenever the employer ceases to do business, the successor employer shall receive and retain all records required to be maintained by this section.

(b) Whenever the employer ceases to do business and there is no successor employer to receive and retain the records for the prescribed period, these records shall be transmitted by registered mail to the director.

(c) At the expiration of the retention period for the records required to be maintained under subsections (1) and (2) of this section, the employer shall transmit these records by registered mail to the director or shall continue to retain such records.

(d) The employer shall also comply with any additional requirements involving transfer of records set forth in WAC 296-62-05215.

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-62-20023, filed 8/27/81; Order 77-14, § 296-62-20023, filed 7/25/77.]

**WAC 296-62-20025 Observation of monitoring.** (1) Employee observation. The employer shall provide affected employees or their representatives an opportunity to observe any measuring or monitoring of employee exposure to coke oven emissions conducted pursuant to WAC 296-62-20007.

(2) Observation procedures.

(a) Whenever observation of the measuring or monitoring of employee exposure to coke oven emissions requires entry into an area where the use of protective clothing or equipment is required, the employer shall provide the observer with and assure the use of such equipment and shall require the observer to comply with all other applicable safety and health procedures.

(b) Without interfering with the measurement, observers shall be entitled to:

(i) An explanation of the measurement procedures;

(ii) Observe all steps related to the measurement of coke oven emissions performed at the place of exposure; and

(iii) Record the results obtained.

[Order 77-14, § 296-62-20025, filed 7/25/77.]

**WAC 296-62-20027 Appendix A--Coke oven emissions substance information sheet.**

#### APPENDIX A

##### COKE OVEN EMISSIONS SUBSTANCE INFORMATION SHEET

###### I. SUBSTANCE IDENTIFICATION

- (1) Substance: Coke oven emissions
- (2) Definition: The benzene-soluble fraction of total particulate matter present during the destructive distillation or carbonization of coal for the production of coke.
- (3) Permissible exposure limit: 150 micrograms per cubic meter of air determined as an average over an 8-hour period.
- (4) Regulated areas: Only employees authorized by your employer should enter a regulated area. The employer is required to designate the following areas as regulated areas: the coke oven battery, including topside and its machinery, pushside and its machinery, and the screening station; and the wharf, the beehive ovens and machinery.

###### II. HEALTH HAZARD DATA

Exposure to coke oven emissions is a cause of lung cancer, and possibly kidney cancer, in humans. Although it does not have an excess number of skin cancer cases in humans, repeated skin contact with coke oven emissions should be avoided.

###### III. PROTECTIVE CLOTHING AND EQUIPMENT

- (1) Respirators: Respirators will be provided by your employer for routine use if your employer is in the process of implementing engineering and work practice controls or where engineering and work practice controls are not feasible or insufficient. You must wear respirators for nonroutine activities or in emergency situations where you are likely to be exposed to levels of coke oven emissions in excess of the permissible exposure limit. Until January 20, 1978, the routine wearing of respirators is voluntary. Until that date, if you choose not to wear a respirator you do not have to do so. You must still have your respirator with you and you must still wear it if you are near visible emissions. Since how well your respirator fits your face is very important, your employer is required to conduct fit tests to make sure the respirator seals properly when you wear it. These tests are simple and rapid and will be explained to you during your training sessions.
- (2) Protective clothing: Your employer is required to provide, and you must wear, appropriate, clean, protective clothing and equipment to protect your body from repeated skin contact with coke oven emissions and from the heat generated during the coking process. This clothing should include such items as jacket and pants and flame resistant gloves. Protective equipment should include face shield or vented goggles, protective helmets and safety shoes, insulated from hot surfaces where appropriate.

## IV. HYGIENE FACILITIES AND PRACTICES

You must not eat, drink, smoke, chew gum or tobacco, or apply cosmetics in the regulated area, except that drinking water is permitted. Your employer is required to provide lunchrooms and other areas for these purposes.

Your employer is required to provide showers, washing facilities, and change rooms. If you work in a regulated area, you must wash your face, and hands before eating. You must shower at the end of the work shift. Do not take used protective clothing out of the change rooms without your employer's permission. Your employer is required to provide for laundering or cleaning of your protective clothing.

## V. SIGNS AND LABELS

Your employer is required to post warning signs and labels for your protection. Signs must be posted in regulated areas. The signs must warn that a cancer hazard is present, that only authorized employees may enter the area, and that no smoking or eating is allowed. In regulated areas where coke oven emissions are above the permissible exposure limit, the signs should also warn that respirators must be worn.

## VI. MEDICAL EXAMINATIONS

If you work in a regulated area at least 30 days per year, your employer is required to provide you with a medical examination every year. The medical examination must include a medical history, a chest x-ray; pulmonary function test; weight comparison; skin examination; a urinalysis and a urine and sputum cytology exam for the early detection of urinary or lung cancer. The cytology exams are only included in the initial exam until you are either 45 years or older or have 5 or more years employment in the regulated areas when the medical exams including these tests are to be given every 6 months. The examining physician will provide a written opinion to your employer containing the results of the medical exams. You should also receive a copy of this opinion.

## VII. OBSERVATION OF MONITORING

Your employer is required to monitor your exposure to coke oven emissions and you are entitled to observe the monitoring procedure. You are entitled to receive an explanation of the measurement procedure, observe the steps taken in the measurement procedure, and to record the results obtained. When the monitoring procedure is taking place in an area where respirators or personal protective clothing and equipment are required to be worn, you must also be provided with and must wear the protective clothing and equipment.

## VIII. ACCESS TO RECORDS

You or your representative are entitled to records of your exposure to coke oven emissions upon request to your employer. Your medical examination records can

be furnished to your physician upon request to your employer.

## IX. TRAINING AND EDUCATION

Additional information on all of these items plus training as to hazards of coke oven emissions and the engineering and work practice controls associated with your job will also be provided by your employer.

[Order 77-14, Appendix A (codified as WAC 296-62-20027), filed 7/25/77.]

**WAC 296-62-20029 Appendix B—Industrial hygiene and medical surveillance guidelines.**

## APPENDIX B

INDUSTRIAL HYGIENE AND MEDICAL  
SURVEILLANCE GUIDELINES

## I. INDUSTRIAL HYGIENE GUIDELINES

- (1) Sampling. (Benzene-Soluble Fraction Total Particulate Matter).

Samples collected should be full shift (8-hour) samples. Sampling should be done using a personal sampling pump with pulsation damper at a flow rate of 2 liters per minute. Samples should be collected on 0.8 micrometer pore size silver membrane filters (37 mm diameter) preceded by Gelman glass fiber type A filters encased in three-piece plastic (polystyrene) field monitor cassettes. The cassette face cap should be on and the plug removed. The rotameter should be checked every hour to ensure that proper flow rates are maintained.

A minimum of three full-shift samples should be collected for each job classification on each battery, at least one during and the night. If disparate results are obtained for particular job classification, sampling should be repeated. It is advisable to sample each shift on more than one day to account for environmental variables (wind, precipitation, etc.) which may affect sampling. Differences in exposures among different work shifts may indicate a need to improve work practices on a particular shift. Sampling results from different shifts for each job classification should not be averaged. Multiple samples from same shift may be used to calculate an average exposure for a particular job classification.

- (2) Analysis.

(a) All extraction glassware is cleaned with dichromic acid cleaning solution, rinsed with tap water, then dionized water, acetone, and allowed to dry completely. The glassware is rinsed with nanograde benzene before use. The Teflon cups are cleaned with benzene then with acetone.

(b) Pre-weigh the 2 ml Perkin-Elmer Teflon cups to one hundredth of a milligram on a Perkin-Elmer autobalance AD 2 Tare weight of the cups is about 50 mg.

- (c) Place the silver membrane filter and glass fiber filter into a 15 ml test tube.
- (d) Extract with 5 ml of benzene for five minutes in an ultrasonic cleaner.
- (e) Filter the extract in 15 ml medium glass fritted funnels.
- (f) Rinse test tube and filters with two 1.5 ml aliquots of benzene and filter through the fritted glass funnel.
- (g) Collect the extract and two rinses in a 10 ml Kontes graduated evaporative concentrator.
- (h) Evaporate down to a 1 ml while rinsing the sides with benzene.
- (i) Pipet 0.5 ml into the Teflon cup and evaporate to dryness in a vacuum oven at 40° C for 3 hours.
- (j) Weight the Teflon cup and the weight gain is due to the benzene soluble residue in half the sample.

## II. MEDICAL SURVEILLANCE GUIDELINES

### (1) General.

The minimum requirements for the medical examination for coke oven workers are given in WAC 296-62-20017.

The initial examination is to be provided to all coke oven workers at the time of the initial assignment to a job in the regulated area. The examination includes a 14" x 17" posterior-anterior chest x-ray and a ILO/UC rating to assure some standardization of x-ray reading, pulmonary function tests (FVC and FEV 1.0), weight, urinalysis, skin examination and a sputum and urinary cytologic examination. These tests are to serve as the baseline for comparing the employee's future test results. Periodic exams include all the elements of the initial exams except that the cytologic tests are to be performed only on those employees who are 45 years of age or older or who have worked for 5 or more years in the regulated area; periodic exams are to be performed semi-annually for this group instead of annually. The examination contents are minimum requirements, additional tests such as lateral and oblique x-rays or additional pulmonary function tests may be performed if deemed necessary.

### (2) Pulmonary function tests.

Pulmonary function tests should be performed in a manner which minimizes subject and operator bias. There has been shown to be learning effects with regard to the results obtained from certain tests, such as FEV 1.0. Best results can be obtained by multiple trials for each subject. The best of three trials or the average of the last three of five trials may be used in obtaining reliable results. The type of equipment used (manufacturer, model, etc.) should be recorded with the results as reliability and accuracy varies and such information may be important in the evaluation of test results. Care should be exercised to obtain the best possible testing equipment.

### (3) Sputum cytology.

Sputum can be collected by aerosol inhalation during the medical exam or by spontaneous early morning cough at home. Sputum is induced by transoral inhalation of an aerosolized solution of eight per cent sodium chloride in water. After inhaling as few as three to five breaths the subject usually yields an adequate sputum specimen. A minimum of three samples should be collected by the subject at home. All sputum should be collected directly into sixty percent alcohol.

Scientific evidence suggests that chest x-rays and sputum cytology should be used together as screening tests for lung cancer in high risk populations, such as coke oven workers. The tests are to be performed every six months on workers who are 45 years of age or older or have worked in the regulated area for 5 or more years. Since the tests seem to be complementary, it may be advantageous to alternate the test procedures. For instance, chest x-rays could be obtained in June and December and sputum cytologies could be obtained in March and September. Facilities for providing necessary diagnostic investigation should be readily available as well as chest physicians, surgeons, radiologists, pathologists, and immunotherapists to provide any necessary treatment services.

[Order 77-14, Appendix B (codified as WAC 296-62-20029), filed 7/25/77.]

## PART P--HAZARDOUS WASTE OPERATIONS AND EMERGENCY RESPONSE

**WAC 296-62-300 Scope, application, and definitions.** (1) Scope. This section covers the following operations, unless the employer can demonstrate that the operation does not involve employee exposure or the reasonable possibility for employee exposure to safety or health hazards:

(a) Clean-up operations required by a governmental body, whether federal, state, local, or other involving hazardous substances that are conducted at uncontrolled hazardous waste sites (including, but not limited to, the EPA's National Priority Site List (NPL), state priority site lists, sites recommended for the EPA NPL, and initial investigations of government identified sites which are conducted before the presence or absence of hazardous substances has been ascertained);

(b) Corrective actions involving clean-up operations at sites covered by the Resource Conservation and Recovery Act of 1976 (RCRA) as amended (42 U.S.C. 6901 et seq.);

(c) Voluntary clean-up operations at sites recognized by federal, state, local, or other governmental bodies as uncontrolled hazardous waste sites;

(d) Operations involving hazardous wastes that are conducted at treatment, storage, and disposal (TSD) facilities regulated by 40 CFR Parts 264 and 265 pursuant to RCRA; or by agencies under agreement with U.S.E.P.A. to implement RCRA regulations; and

(e) Emergency response operations for releases of, or substantial threats of releases of, hazardous substances without regard to the location of the hazard.

(2) Application.

(a) All requirements of this chapter and chapters 296-24 and 296-155 WAC apply pursuant to their terms to hazardous waste and emergency response operations whether covered by this part or not. If there is a conflict or overlap, the provision more protective of employee safety and health shall apply.

(b) Hazardous substance clean-up operations within the scope of subsection (1)(a), (b), and (c) of this section must comply with all sections (WAC 296-62-300 through 296-62-3145) except WAC 296-62-3140, 296-62-3110 (4) and (5), and 296-62-3112.

(c) Operations within the scope of subsection (1)(d) of this section must comply only with the requirements of WAC 296-62-3140 and 296-62-3110 (4) and (5).

Exceptions: For large quantity generators of hazardous waste who store those wastes less than 90 days and for small quantity generators of hazardous wastes, who have emergency response teams that respond to releases of, or substantial threats of releases of, hazardous substances, for their RCRA workplaces only WAC 296-62-3110(5) is applicable. Generators of hazardous wastes who do not have emergency response teams that respond to releases of, or substantial threats of releases of, hazardous substances are exempt from the requirements of this section.

(d) Emergency response operations for releases of, or substantial threats of releases of hazardous substances which are not covered by subsection (1)(a) through (d) of this section must only comply with the requirements of WAC 296-62-3112.

(3) Definitions.

(a) "Buddy system" means a system of organizing employees into work groups in such a manner that each employee of the work group is designated to be observed by at least one other employee in the work group. The purpose of the buddy system is to provide rapid assistance to employees in the event of an emergency.

(b) "Clean-up operation" means an operation where hazardous substances are removed, contained, incinerated, neutralized, stabilized, cleared-up, or in any other manner processed or handled with the ultimate goal of making the site safer for people or the environment.

(c) "Decontamination" means the removal of hazardous substances from employees and their equipment to the extent necessary to preclude the occurrence of foreseeable adverse health effects.

(d) "Emergency response" or "responding to emergencies" means a response effort by employees from outside the immediate release area or by other designated responders (i.e., mutual aid groups, local fire departments, etc.) to an occurrence which results, or is likely to result, in an uncontrolled release of a hazardous substance. Responses to incidental releases of hazardous substances where the substance can be absorbed, neutralized, or otherwise controlled at the time of release by employees in the immediate release area or by maintenance personnel are not considered to be emergency responses within the scope of this standard. Responses to

release of hazardous substances where there is no potential safety or health hazard (i.e., fire, explosion, or chemical exposure) are not considered to be emergency responses.

(e) "Facility" means (i) any building structure, installation, equipment, pipe or pipeline (including any pipe into a sewer or publicly-owned treatment works), well, pit, pond, lagoon, impoundment, ditch, storage container, motor vehicle, rolling stock, or aircraft, or (ii) any site or area where a hazardous substance has been deposited, stored, disposed of, or placed, or otherwise come to be located; but does not include any consumer product in consumer use or any water-borne vessel.

(f) "Hazardous materials response (HAZMAT) team" means an organized group of employees, designated by the employer, who are expected to perform work, to handle and control actual or potential leaks or spills of hazardous substances requiring possible close approach to the substance. The team members perform responses to releases or potential releases of hazardous substances for the purpose of control or stabilization of the incident. A HAZMAT team is not a fire brigade nor is a typical fire brigade a HAZMAT team. A HAZMAT team, however, may be a separate component of a fire brigade or fire department.

(g) "Hazardous substance" means any substance designated or listed under (g)(i) through (iv) of this subsection, exposure to which results or may result in adverse effects on the health or safety of employees:

(i) Any substance defined under section 101(14) of CERCLA;

(ii) Any biological agent and other disease-causing agent as defined in section 101(33) of CERCLA;

(iii) Any substance listed by the United States Department of Transportation as hazardous materials under WAC 480-12-195; and

(iv) Hazardous waste as herein defined.

(h) "Hazardous waste" means:

(i) A waste or combination of wastes as defined in WAC 173-303-040; or

(ii) Those substances defined in WAC 480-12-195.

(i) "Hazardous waste operation" means any operation conducted within the scope of this standard.

(j) "Hazardous waste site" or "site" means any facility or location within the scope of this standard at which hazardous waste operations take place.

(k) "Health hazard" means a chemical, mixture of chemicals, or a pathogen for which there is statistically significant evidence based on at least one study conducted in accordance with established scientific principles that acute or chronic health effects may occur in exposed employees. The term "health hazard" includes chemicals which are carcinogens, toxic or highly toxic agents, reproductive toxins, irritants, corrosives, sensitizers, hepatotoxins, nephrotoxins, neurotoxins, agents which act on the hematopoietic system, and agents which damage the lungs, skin, eyes, or mucous membranes. It also includes stress due to temperature extremes. Further definition of the terms used above can be found in Appendix A to WAC 296-62-054 through 296-62-05427.

(l) "IDLH" or "immediately dangerous to life or health" means any atmospheric concentration of any toxic, corrosive, or asphyxiant substance that poses an immediate threat to life or would cause irreversible or delayed adverse health effects or would interfere with an individual's ability to escape from a dangerous atmosphere.

(m) "Oxygen deficiency" means that concentration of oxygen by volume below which atmosphere supplying respiratory protection must be provided. It exists in atmospheres where the percentage of oxygen by volume is less than 19.5 percent oxygen.

(n) "Permissible exposure limit" means the exposure, inhalation, or dermal permissible limit specified in WAC 296-62-075 through 296-62-07515.

(o) "Published exposure level" means the exposure limits published in "NIOSH Recommendations for Occupational Health Standards" dated 1986 incorporated by reference, or if none is specified, the exposure limits published in the standards specified by the American Conference of Governmental Industrial Hygienists in their publication "Threshold Limit Values and Biological Exposure Indices for 1988-89" dated 1988 incorporated by reference.

(p) "Post emergency response" means that portion of an emergency response performed after the immediate threat of a release has been stabilized or eliminated and clean-up of the site has begun. If post emergency response is performed by an employer's own employees who were part of the initial emergency response, it is considered to be part of the initial response and not post emergency response. However, if a group of an employer's own employees, separate from the group providing initial response, performs the clean-up operation, then the separate group of employees would be considered to be performing post-emergency response and subject to WAC 296-62-3112(11).

(q) "Qualified person" means a person with specific training, knowledge, and experience in the area for which the person has responsibility and the authority to control.

(r) "Site safety and health supervisor (or official)" means the individual located on a hazardous waste site who is responsible to the employer and has the authority and knowledge necessary to implement the site safety and health plan and verify compliance with applicable safety and health requirements.

(s) "Site work zones" means an exclusion zone, contamination reduction zone, and a clean zone established at a hazardous waste site before clean-up work begins to prevent or reduce the movement of contaminants from the site to uncontaminated areas and to control public, employee, and equipment exposure to hazardous substances.

(i) The exclusion zone is the innermost of the zones and is where contamination does occur. The contamination reduction zone is the zone between the exclusion zone and the clean zone and serves as a transition and buffer between the contaminated and clean zone to further reduce the physical transfer of contaminating substances to the public, employees, and equipment. The

clean zone is the outermost of the zones and is a non-contaminated or clean area.

(ii) The contaminated reduction corridors are the designated areas within the contaminated reduction zone for the decontamination of personnel and equipment.

(t) "Small quantity generator" means a generator of hazardous wastes who in any calendar month generates no more than 1000 kilograms (2205 pounds) of hazardous waste in that month.

(u) "Uncontrolled hazardous waste site" means an area where an accumulation of hazardous waste creates a threat to the health and safety of individuals or the environment or both. Some sites are found on public lands, such as those created by former municipal, county, or state landfills where illegal or poorly managed waste disposal has taken place. Other sites are found on private property, often belonging to generators or former generators of hazardous waste. Examples of such sites include, but are not limited to, surface impoundments, landfills, dumps, and tank or drum farms. Normal operations at TSD sites are not covered by this definition.

[Statutory Authority: Chapter 49.17 RCW. 89-21-018 (Order 89-10), § 296-62-300, filed 10/10/89, effective 11/24/89; 88-21-002 (Order 88-23), § 296-62-300, filed 10/6/88, effective 11/7/88.]

#### WAC 296-62-3010 Safety and health program.

Note: Safety and health programs developed and implemented to meet other federal, state, or local regulations are considered acceptable in meeting this requirement if they cover or are modified to cover the topics required in this section. An additional or separate safety and health program is not required by this section.

##### (1) General.

(a) Employers shall develop and implement a written safety and health program for their employees involved in hazardous waste operations. The program shall be designed to identify, evaluate, and control safety and health hazards and provide for emergency response for hazardous waste operations.

(b) The written safety and health program shall incorporate the following:

(i) An organizational structure;

(ii) A comprehensive workplan;

(iii) A site-specific safety and health plan which need not repeat the employer's standard operating procedures required in (b)(vi) of this subsection;

(iv) The safety and health training program;

(v) The medical surveillance program;

(vi) The employer's standard operating procedures for safety and health; and

(vii) Any necessary interface between general program and site specific activities.

(c) Site excavation. Site excavations created during initial site preparation or during hazardous waste operations shall be shored or sloped as appropriate to prevent accidental collapse in accordance with subpart N of chapter 296-155 WAC.

(d) Contractors and subcontractors. An employer who retains contractor or subcontractor services for work in hazardous waste operations shall inform those contractors, subcontractors, or their representatives of the site emergency response procedures and any potential fire,



explosion, health, safety, or other hazards of the hazardous waste operation that have been identified by the employer, including those identified in the employer's information program.

(e) Program availability. The written safety and health program shall be made available to any contractor or subcontractor or their representative who will be involved with the hazardous waste operation; to employees; to employee designated representatives; to WISHA personnel, and to personnel of other federal, state, or local agencies with regulatory authority over the site.

(2) Organizational structure part of the site program.

(a) The organizational structure part of the program shall establish the specific chain of command and specify the overall responsibilities of supervisors and employees. It shall include at a minimum, the following elements:

(i) A general supervisor who has the responsibility and authority to direct all hazardous waste operations.

(ii) A site safety and health supervisor who has the responsibility and authority to develop and implement the site safety and health plan and verify compliance.

(iii) All other personnel needed for hazardous waste site operations and emergency response and their general functions and responsibilities.

(iv) The lines of authority, responsibility, and communication.

(b) The organizational structure shall be reviewed and updated as necessary to reflect the current status of waste site operations.

(3) Comprehensive workplan part of the site program. The comprehensive workplan shall address the tasks and objectives of site operations and the logistics and resources required to reach those tasks and objectives.

(a) The comprehensive workplan shall address anticipated clean-up activities as well as normal operating procedures which need not repeat the employers procedures available elsewhere.

(b) The comprehensive workplan shall define work tasks and objectives and identify the methods for accomplishing those tasks and objectives.

(c) The comprehensive workplan shall establish personnel requirements for implementing the plan.

(d) The comprehensive workplan shall provide for the implementation of the training required in WAC 296-62-3040.

(e) The comprehensive workplan shall provide for the implementation of the required informational programs required in WAC 296-62-3080.

(f) The comprehensive workplan shall provide for the implementation of the medical surveillance program described in WAC 296-62-3050.

(4) Site-specific safety and health plan part of the program.

(a) General. The site safety and health plan, which must be kept on site, shall address the safety and health hazards of each phase of site operation; and include the requirements and procedures for employee protection.

(b) Elements. The site safety and health plan, as a minimum, shall address the following:

(i) Names of key personnel and alternates responsible for site safety and health, including a site safety and health supervisor.

(ii) A safety and health risk or hazard analysis for each site task and operation found in the workplan.

(iii) Employee training assignments to assure compliance with WAC 296-62-3040.

(iv) Personal protective equipment to be used by employees for each of the site tasks and operations being conducted as required by the personal protective equipment program in WAC 296-62-3060(5).

(v) Medical surveillance requirements in accordance with the program in WAC 296-62-3050.

(vi) Frequency and types of air monitoring, personnel monitoring, and environmental sampling techniques and instrumentation to be used, including methods of maintenance and calibration of monitoring and sampling equipment to be used.

(vii) Site control measures in accordance with the site control program required in WAC 296-62-3030.

(viii) Decontamination procedures in accordance with WAC 296-62-3100.

(ix) An emergency response plan meeting the requirements of WAC 296-62-3110 for safe and effective responses to emergencies, including the necessary PPE and other equipment.

(x) Confined space entry procedures.

(xi) A spill containment program meeting the requirements of WAC 296-62-3090.

(c) Preentry briefing. The site specific safety and health plan shall provide for preentry briefings to be held prior to initiating any site activity, and at such other times as necessary to ensure that employees are apprised of the site safety and health plan and that this plan is being followed. The information and data obtained from site characterization and analysis work required in WAC 296-62-3020 shall be used to prepare and update the site safety and health plan.

(d) Effectiveness of site safety and health plan. Inspections shall be conducted by the site safety and health supervisor or, in the absence of that individual, another individual who is knowledgeable in occupational safety and health acting on behalf of the employer as necessary to determine the effectiveness of the site safety and health plan. Any deficiencies in the effectiveness of the site safety and health plan shall be corrected by the employer.

[Statutory Authority: Chapter 49.17 RCW. 89-21-018 (Order 89-10), § 296-62-3010, filed 10/10/89, effective 11/24/89; 88-21-002 (Order 88-23), § 296-62-3010, filed 10/6/88, effective 11/7/88.]

**WAC 296-62-3020 Site characterization and analysis.** (1) General. Hazardous waste sites shall be evaluated in accordance with this section to identify specific site hazards and to determine the appropriate safety and health control procedures needed to protect employees from the identified hazards.

(2) Preliminary evaluation. A preliminary evaluation of a site's characteristics shall be performed prior to site entry by a qualified person in order to aid in the selection of appropriate employee protection methods prior to



site entry. Immediately after initial site entry, a more detailed evaluation of the site's specific characteristics shall be performed by a qualified person in order to further identify existing site hazards and to further aid in the selection of the appropriate engineering controls and personal protective equipment for the tasks to be performed.

(3) Hazard identification. All suspected conditions that may pose inhalation or skin absorption hazards that are immediately dangerous to life or health (IDLH), or other conditions that may cause death or serious harm, shall be identified during the preliminary survey and evaluated during the detailed survey. Examples of such hazards include, but are not limited to, confined space entry, potentially explosive or flammable situations, visible vapor clouds, or areas where biological indicators such as dead animals or vegetation are located.

(4) Required information. The following information to the extent available shall be obtained by the employer prior to allowing employees to enter a site:

- (a) Location and approximate size of the site.
- (b) Description of the response activity and/or the job task to be performed.
- (c) Duration of the planned employee activity.
- (d) Site topography and accessibility by air and roads.
- (e) Safety and health hazards expected at the site.
- (f) Pathways for hazardous substance dispersion.
- (g) Present status and capabilities of emergency response teams that would provide assistance to hazardous waste clean-up site employees at the time of an emergency.

(h) Hazardous substances and health hazards involved or expected at the site and their chemical and physical properties.

(5) Personal protective equipment. Personal protective equipment (PPE) shall be provided and used during initial site entry in accordance with the following requirements:

(a) Based upon the results of the preliminary site evaluation, an ensemble of PPE shall be selected and used during initial site entry which will provide protection to a level of exposure below established permissible exposure limits and published exposure levels for known or suspected hazardous substances and health hazards, and which will provide protection against other known and suspected hazards identified during the preliminary site evaluation. If there is no permissible exposure limit or published exposure level, the employer may use other published studies and information as a guide to appropriate personal protective equipment.

(b) If positive-pressure self-contained breathing apparatus is not used as part of the entry ensemble, and if respiratory protection is warranted by the potential hazards identified during the preliminary site evaluation, an escape self-contained breathing apparatus of at least five minute's duration shall be carried by employees during initial site entry.

(c) If the preliminary site evaluation does not produce sufficient information to identify the hazards or suspected hazards of the site an ensemble providing protection equivalent to Level B PPE shall be provided as

minimum protection and direct reading instruments shall be used as appropriate for identifying IDLH conditions. (See WAC 296-62-3170 - Appendix B for a description of Level B hazards and the recommendations for Level B protective equipment.)

(d) Once the hazards of the site have been identified, the appropriate PPE shall be selected and used in accordance with WAC 296-62-3060.

(6) Monitoring. The following monitoring shall be conducted during initial site entry when the site evaluation produces information that shows the potential for ionizing radiation or IDLH conditions, or when the site information is not sufficient to rule out these possible conditions:

(a) Monitoring with direct reading instruments for hazardous levels of ionizing radiation.

(b) Monitoring the air with appropriate direct reading equipment (i.e., combustible gas meters, detector tubes) for IDLH and other conditions that may cause death or serious harm (combustible or explosive atmospheres, oxygen deficiency, toxic substances).

(c) Visually observing for signs of actual or potential IDLH or other dangerous conditions.

(d) An ongoing air monitoring program in accordance with WAC 296-62-3070 shall be implemented after site characterization has determined the site is safe for the start-up of operations.

(7) Risk identification. Once the presence and concentrations of specific hazardous substances and health hazards have been established, the risks associated with these substances shall be identified. Employees who will be working on the site shall be informed of any risks that have been identified. In situations covered by WAC 296-62-054 through 296-62-05427, training required by those standards need not be duplicated.

Note: Risks to consider include, but are not limited to:

- (a) Exposures exceeding the permissible exposure limits and published exposure levels.
- (b) IDLH concentrations.
- (c) Potential skin absorption and irritation sources.
- (d) Potential eye irritation sources.
- (e) Explosion sensitivity and flammability ranges.
- (f) Oxygen deficiency.

(8) Employee notification. Any information concerning the chemical, physical, and toxicologic properties of each substance known or expected to be present on site that is available to the employer and relevant to the duties an employee is expected to perform shall be made available to all employees prior to the commencement of their work activities. The employer may utilize information developed for the hazard communication standard for this purpose.

[Statutory Authority: Chapter 49.17 RCW. 89-21-018 (Order 89-10), § 296-62-3020, filed 10/10/89, effective 11/24/89; 88-21-002 (Order 88-23), § 296-62-3020, filed 10/6/88, effective 11/7/88.]

**WAC 296-62-3030 Site control.** (1) General. Appropriate site control procedures shall be implemented to control employee exposure to hazardous substances before clean-up work begins.

(2) Site control program. A site control program for protecting employees which is part of the employer's site safety and health program required in WAC 296-62-3010 shall be developed during the planning stages of a hazardous waste clean-up operation and modified as necessary as new information becomes available.

(3) Elements of the site control program. The site control program shall, as a minimum, include: A site map; site work zones; the use of a "buddy system"; site communications including alerting means for emergencies; the standard operating procedures or safe work practices; and, identification of nearest medical assistance. Where these requirements are covered elsewhere they need not be repeated.

(4) Site work zones.

(a) The site work zones shall be the exclusion zone, contamination reduction zone, and the clean zone.

(b) Decontamination procedures shall take place in the contamination reduction corridor consisting, if practical, of separate corridors for personnel and for equipment.

(c) An entry and exit check point must be established at the boundary of the exclusion zone to regulate the flow of personnel and equipment into and out of the zone. Exit from the exclusion zone must be through a contamination reduction corridor.

(d) Access to the contamination reduction zone from the clean zone is through a control point. Personnel entering or working in the contamination zone shall wear the prescribed personnel protective equipment, if required, for working in this zone. Entering the clean zone requires removal of any protective equipment worn in the contamination reduction zone.

[Statutory Authority: Chapter 49.17 RCW. 89-21-018 (Order 89-10), § 296-62-3030, filed 10/10/89, effective 11/24/89; 88-21-002 (Order 88-23), § 296-62-3030, filed 10/6/88, effective 11/7/88.]

#### **WAC 296-62-3040 Training.** (1) General.

(a) All employees working on site (such as but not limited to equipment operators, general laborers, and others) exposed to hazardous substances, health hazards, or safety hazards, and their supervisors and management responsible for the site, shall receive training meeting the requirements of this subsection before they are permitted to engage in hazardous waste operations that could expose them to hazardous substances, safety, or health hazards, and they shall review training as specified in this subsection.

(b) Employees shall not be permitted to participate in or supervise field activities until they have been trained to a level required by their job function and responsibility.

(2) Elements to be covered. The training shall thoroughly cover the following:

(a) Names of personnel and alternates responsible for site safety and health;

(b) Safety, health, and other hazards present on the site;

(c) Use of personal protective equipment;

(d) Work practices by which the employee can minimize risks from hazards;

(e) Safe use of engineering controls and equipment on the site;

(f) Medical surveillance requirements including recognition of symptoms and signs which might indicate overexposure to hazards; and

(g) The contents of items (vii) through (x) of the site safety and health plan set forth in WAC 296-62-3010 (4)(b).

(3) Initial training.

(a) General site workers (such as equipment operators, general laborers, and supervisory personnel) engaged in hazardous substance removal or other activities which expose or potentially expose workers to hazardous substances and health hazards shall receive a minimum of 40 hours of instruction off the site, and a minimum of three days actual field experience under the direct supervision of a trained, experienced supervisor.

(b) Effective June 1, 1990, employers shall adjust the initial training required by (a) of this subsection, to meet as a minimum the following training requirements:

(i) Workers engaged in hazardous waste operation within the exclusion zone and the contamination reduction zone shall receive 80 hours of instruction off the site, and a minimum of three days actual field experience under the direct supervision of a trained, experienced supervisor.

(ii) Equipment operators and transport vehicle operators engaged in hazardous waste operation within the exclusion zone and the contamination reduction zone shall receive 40 hours of training, and a minimum of three days actual field experience under the direct supervision of a trained, experienced supervisor.

(iii) Supervisors engaged in hazardous waste operation within the exclusion zone and the contamination reduction zone shall receive as a minimum the same number of hours of instruction as the workers for whom the supervisor is directly responsible, and a minimum of three days actual field experience under the direct supervision of a trained, experienced supervisor.

(c) Workers on site only occasionally for a specific limited task (such as, but not limited to, ground water monitoring, land surveying, or geophysical surveying) and who are unlikely to be exposed over permissible exposure limits and published exposure levels shall receive a minimum of 24 hours of instruction off the site, and the minimum of one day actual field experience under the direct supervision of a trained, experienced supervisor.

(d) Workers regularly on site who work in areas other than the exclusion zone and the contamination reduction zone which have been monitored and fully characterized indicating that exposures are under permissible exposure limits and published exposure levels where respirators are not necessary, and the characterization indicates that there are no health hazards or the possibility of an emergency developing, shall receive a minimum of 24 hours of instruction off the site and the minimum of one day actual field experience under the direct supervision of a trained, experienced supervisor.

(e) Workers with 24 hours of training who are covered by (c) and (d) of this subsection, and who become

general site workers or who are required to wear respirators, shall have the additional 16 hours and two days of training necessary to total the training specified in (a) of this subsection.

(4) Management and supervisor training. On-site management and supervisors directly responsible for, or who supervise employees engaged in, hazardous waste operations shall receive 40 hours initial training, and three days of supervised field experience (the training may be reduced to 24 hours and one day if the only area of their responsibility is employees covered by subsection (3)(c) and (d) of this section) and at least eight additional hours of specialized training at the time of job assignment on such topics as, but not limited to, the employer's safety and health program and the associated employee training program, personal protective equipment program, spill containment program, and health hazard monitoring procedure and techniques.

(5) Qualifications for trainers. Trainers shall be qualified to instruct employees about the subject matter that is being presented in training. Such trainers shall have satisfactorily completed a training program for teaching the subjects they are expected to teach, or they shall have the academic credentials and instructional experience necessary for teaching the subjects. Instructors shall demonstrate competent instructional skills and knowledge of the applicable subject matter.

(6) Training certification. Employees and supervisors that have received and successfully completed the training and field experience specified in subsections (1) through (4) of this section shall be certified by their instructor or the head instructor and trained supervisor as having successfully completed the necessary training. A written certificate shall be given to each person so certified. Any person who has not been so certified or who does not meet the requirements of subsection (9) of this section shall be prohibited from engaging in hazardous waste operations.

(7) Emergency response. Employees who are engaged in responding to hazardous emergency situations at hazardous waste clean-up sites that may expose them to hazardous substances shall be trained in how to respond to expected emergencies.

(8) Refresher training. Employees specified in subsection (1) of this section, and managers specified in subsection (4) of this section, shall receive eight hours of refresher training annually on the items specified in subsections (2) and/or (4) of this section, any critique of incidents that have occurred in the past year that can serve as training examples of related work, and other relevant topics.

(9) Equivalent training. Employers who can show by documentation or certification that an employee's work experience and/or training has resulted in training equivalent to that training required in subsections (1) through (4) of this section shall not be required to provide the initial training requirements of those sections to such employees. However, certified employees new to a site shall receive appropriate, site specific training before site entry and have appropriate supervised field experience at the new site. Equivalent training includes any

academic training or the training that existing employees might have already received from actual hazardous waste site work experience.

[Statutory Authority: Chapter 49.17 RCW. 89-21-018 (Order 89-10), § 296-62-3040, filed 10/10/89, effective 11/24/89; 88-21-002 (Order 88-23), § 296-62-3040, filed 10/6/88, effective 11/7/88.]

**WAC 296-62-3050 Medical surveillance.** (1) General. Employers engaged in operations specified in WAC 296-62-300 (1)(a) through (d) and not covered by WAC 296-62-300(2), exceptions; and employers of employees specified in WAC 296-62-3112(9) shall institute a medical surveillance program in accordance with this subsection.

(2) Employees covered. The medical surveillance program shall be instituted by the employer for the following employees:

(a) All employees who are or may be exposed to hazardous substances or health hazards at or above the permissible exposure limits or, if there is no permissible exposure limit, above the published exposure levels for these substances, without regard to the use of respirators, for 30 days or more a year;

(b) All employees who wear a respirator for 30 days or more a year or as required by WAC 296-62-071; and

(c) All employees who are injured due to overexposure from an emergency incident involving hazardous substances or health hazards; or

(d) Members of HAZMAT teams.

(3) Frequency of medical examinations and consultations. Medical examinations and consultations shall be made available by the employer to each employee covered under subsection (1) of this section on the following schedules:

(a) For employees covered under WAC 296-62-3150 (2)(a), (b), and (d):

(i) Prior to assignment;

(ii) At least once every twelve months for each employee covered unless the attending physician believes a longer interval (not greater than biennially) is appropriate;

(iii) At termination of employment or reassignment to an area where the employee would not be covered if the employee has not had an examination within the last six months;

(iv) As soon as possible upon notification by an employee that the employee has developed signs or symptoms indicating possible overexposure to hazardous substances or health hazards, or that the employee has been injured or exposed above the permissible exposure limits, or published exposure levels in an emergency situation;

(v) At more frequent times, if the examining physician determines that an increased frequency of examination is medically necessary.

(b) For employees covered under subsection (1)(c) of this section and for all employees including those employees covered by WAC 296-62-300 (1)(e) who may have been injured, received a health impairment, developed signs or symptoms which may have resulted from exposure to hazardous substances resulting from an

emergency incident, or exposed during an emergency incident to hazardous substances at concentrations above the permissible exposure limits or the published exposure levels without the necessary personal protective equipment being used:

(i) As soon as possible following the emergency incident or development of signs or symptoms;

(ii) At additional times, if the examining physician determines that follow-up examinations or consultations are medically necessary.

(4) Content of medical examinations and consultations.

(a) Medical examinations required by subsection (3) of this section shall include a medical and work history (or updated history if one is in the employee's file) with special emphasis on symptoms related to the handling of hazardous substances and health hazards, and to fitness for duty including the ability to wear any required PPE under conditions (i.e., temperature extremes) that may be expected at the worksite.

(b) The content of medical examinations or consultations made available to employees pursuant to this section shall be determined by the examining physician. The guidelines in the *Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities* (See Appendix D, Reference #10) should be consulted.

(5) Examination by a physician and costs. All medical examinations and procedures shall be performed by or under the supervision of a licensed physician, preferably one knowledgeable in occupational medicine, and shall be provided without cost to the employee, without loss of pay, and at a reasonable time and place.

(6) Information provided to the physician. The employer shall provide one copy of this standard and its appendices to the examining physician, and in addition, the following for each employee:

(a) A description of the employee's duties as they relate to the employee's exposures;

(b) The employee's exposure levels or anticipated exposure levels;

(c) A description of any personal protective equipment used or to be used;

(d) Information from previous medical examinations of the employee which is not readily available to the examining physician; and

(e) Information required in WAC 296-62-071 through 296-62-07121.

(7) Physician's written opinion.

(a) The employer shall obtain and furnish the employee with a copy of a written opinion from the examining physician containing the following:

(i) The physician's opinion as to whether the employee has any detected medical conditions which would place the employee at increased risk of material impairment of the employee's health from work in hazardous waste operations or emergency response or from respirators use.

(ii) The physician's recommended limitations upon the employees assigned work.

(iii) The results of the medical examination and tests if requested by the employee.

(iv) A statement that the employee has been informed by the physician of the results of the medical examination and any medical conditions which require further examination or treatment.

(b) The written opinion obtained by the employer shall not reveal specific findings or diagnoses unrelated to occupational exposures.

(8) Recordkeeping.

(a) An accurate record of the medical surveillance required by this section shall be retained. This record shall be retained for the period specified and meet the criteria of Part B of chapter 296-62 WAC.

(b) The record required in (a) of this subsection shall include at least the following information:

(i) The name and Social Security number of the employee;

(ii) Physicians' written opinions, recommended limitations, and results of examinations and tests;

(iii) Any employee medical complaints related to exposure to hazardous substances;

(iv) A copy of the information provided to the examining physician by the employer, with the exception of the standard and its appendices.

[Statutory Authority: Chapter 49.17 RCW. 89-21-018, § 296-62-3050, filed 10/10/89, effective 11/24/89; 88-21-002 (Order 88-23), § 296-62-3050, filed 10/6/88, effective 11/7/88.]

**WAC 296-62-3060 Engineering controls, work practices, and personal protective equipment for employee protection.** (1) Engineering controls, work practices, personal protective equipment, or a combination of these shall be implemented in accordance with this section to protect employees from exposure to hazardous substances and health hazards.

(a) Engineering controls, work practices, and PPE for substances regulated in chapter 296-62 WAC.

Engineering controls and work practices shall be instituted to reduce and maintain employee exposure to or below the permissible exposure limits for substances regulated by this chapter, except to the extent that such controls and practices are not feasible.

Note: Engineering controls which may be feasible include the use of pressurized cabs or control booths on equipment, and/or the use of remotely operated material handling equipment. Work practices which may be feasible are removing all nonessential employees from potential exposure during opening of drums, wetting down dusty operations, and locating employees upwind of possible hazards.

(b) Whenever engineering controls and work practices are not feasible, PPE shall be used to reduce and maintain exposures to or below the permissible exposure limits or dose limits for substances regulated by chapter 296-62 WAC.

(c) The employer shall not implement a schedule of employee rotation as a means of compliance with permissible exposure limits or dose limits except when there is no other feasible way of complying with the airborne or dermal dose limits for ionizing radiation.

(d) The provisions of WAC 296-62-080 through 296-62-09013, 296-62-09015 through 296-62-09055, and 296-62-100 through 296-62-130 shall be followed.

(2) Engineering controls, work practices, and personal protective equipment for substances not regulated in chapter 296-62 WAC. An appropriate combination of engineering controls, work practices, and personal protective equipment shall be used to reduce and maintain employee exposure to or below published exposure levels for hazardous substances and health hazards not regulated by chapter 296-62 WAC. The employer may use the published literature and MSDS as a guide in making the employer's determination as to what level of protection the employer believes is appropriate for hazardous substances and health hazards for which there is no permissible exposure limit or published exposure level.

(3) Personal protective equipment selection.

(a) Personal protective equipment (PPE) shall be selected and used which will protect employees from the hazards and potential hazards they are likely to encounter as identified during the site characterization and analysis.

(b) Personal protective equipment selection shall be based on an evaluation of the performance characteristics of the PPE relative to the requirements and limitations of the site, the task-specific conditions and duration, and the hazards and potential hazards identified at the site.

(c) Positive pressure self-contained breathing apparatus, or positive pressure air-line respirators equipped with an escape air supply shall be used when chemical exposure levels present will create a substantial possibility of immediate death, immediate serious illness or injury, or impair the ability to escape.

(d) Totally-encapsulating chemical protective suits (protection equivalent to Level A protection as recommended in Appendix B) shall be used in conditions where skin absorption of a hazardous substance may result in a substantial possibility of immediate death, immediate serious illness or injury, or impair the ability to escape.

(e) The level of protection provided by PPE selection shall be increased when additional information or site conditions indicate that increased protection is necessary to reduce employee exposures below permissible exposure limits and published exposure levels for hazardous substances and health hazards. (See WAC 296-62-3170 - Appendix B for guidance on selecting PPE ensembles.)

Note: The level of employee protection provided may be decreased when additional information or site conditions show that decreased protection will not result in increased hazardous exposures to employees.

(f) Personal protective equipment shall be selected and used to meet the requirements of chapter 296-24 WAC, Part A-1, and additional requirements specified in this part.

(4) Totally-encapsulating chemical protective suits.

(a) Totally-encapsulating suits shall protect employees from the particular hazards which are identified during site characterization and analysis.

(b) Totally-encapsulating suits shall be capable of maintaining positive air pressure. (See WAC 296-62-3160 - Appendix A for a test method which may be used to evaluate this requirement.)

(c) Totally-encapsulating suits shall be capable of preventing inward test gas leakage of more than 0.5 percent. (See WAC 296-62-3160 - Appendix A for a test method which may be used to evaluate this requirement.)

(5) Personal protective equipment (PPE) program. A written personal protective equipment program, which is part of the employer's safety and health program required in WAC 296-62-3010 and which shall be part of the site-specific safety and health plan shall be established. The PPE program shall address the elements listed below. When elements, such as donning and doffing procedures, are provided by the manufacturer of a piece of equipment and are attached to the plan, they need not be rewritten into the plan as long as they adequately address the procedure or element.

(a) PPE selection based on site hazards,

(b) PPE use and limitations of the equipment,

(c) Work mission duration,

(d) PPE maintenance and storage,

(e) PPE decontamination and disposal,

(f) PPE training and proper fitting,

(g) PPE donning and doffing procedures,

(h) PPE inspection procedures prior to, during, and after use,

(i) Evaluation of the effectiveness of the PPE program, and

(j) Limitations during temperature extremes, heat stress, and other appropriate medical considerations.

[Statutory Authority: Chapter 49.17 RCW. 89-21-018, § 296-62-3060, filed 10/10/89, effective 11/24/89; 88-21-002 (Order 88-23), § 296-62-3060, filed 10/6/88, effective 11/7/88.]

**WAC 296-62-3070 Monitoring.** (1) General.

(a) Monitoring shall be performed in accordance with this section where there may be a question of employee exposure to concentrations of hazardous substances in order to assure proper selection of engineering controls, work practices, and personal protective equipment so that employees are not exposed to levels which exceed permissible exposure limits or published exposure levels for hazardous substances.

(b) Air monitoring shall be used to identify and quantify airborne levels of hazardous substances and safety and health hazards in order to determine the appropriate level of employee protection needed on site.

(2) Initial entry. Upon initial entry, representative air monitoring shall be conducted to identify any IDLH condition, exposure over permissible exposure limits or published exposure levels, exposure over a radioactive material's dose limits, or other dangerous condition, such as the presence of flammable atmospheres or oxygen-deficient environments.

(3) Periodic monitoring. Periodic monitoring shall be conducted when the possibility of an IDLH condition or flammable atmosphere has developed or when there is indication that exposures may have risen over permissible exposure limits or published exposure levels since prior monitoring. Situations where it shall be considered whether the possibility that exposures have risen are as follows:

(a) When work begins on a different portion of the site.

(b) When contaminants other than those previously identified are being handled.

(c) When a different type of operation is initiated (e.g., drum opening as opposed to exploratory well drilling).

(d) When employees are handling leaking drums or containers or working in areas with obvious liquid contamination (e.g., a spill or lagoon).

(e) When a sufficient reasonable interval has passed so that exposures may have significantly increased.

(4) Monitoring of high-risk employees. After the actual clean-up phase of any hazardous waste operation commences; for example, when soil, surface water, or containers are moved or disturbed; the employer shall monitor those employees likely to have the highest exposures to hazardous substances and health hazards likely to be present above permissible exposure limits or published exposure levels by using personal sampling frequently enough to characterize employee exposures. If the employees likely to have the highest exposure are over permissible exposure limits or published exposure levels, then monitoring shall continue to determine all employees likely to be above those limits. The employer may utilize a representative sampling approach by documenting that the employees and chemicals chosen for monitoring are based on the criteria stated in this subsection.

Note: It is not required to monitor employees engaged in site characterization operations covered by WAC 296-62-3020.

[Statutory Authority: Chapter 49.17 RCW. 89-21-018, § 296-62-3070, filed 10/10/89, effective 11/24/89; 88-21-002 (Order 88-23), § 296-62-3070, filed 10/6/88, effective 11/7/88.]

**WAC 296-62-3080 Informational programs.** Employers shall develop and implement a program which is part of the employer's safety and health program required in WAC 296-62-3010 to inform employees, contractors, and subcontractors (or their representative) actually engaged in hazardous waste operations of the nature, level, and degree of exposure likely as a result of participation in such hazardous waste operations. Employees, contractors, and subcontractors working outside of the operations part of a site are not covered by this standard.

[Statutory Authority: Chapter 49.17 RCW. 89-21-018, § 296-62-3080, filed 10/10/89, effective 11/24/89; 88-21-002 (Order 88-23), § 296-62-3080, filed 10/6/88, effective 11/7/88.]

**WAC 296-62-3090 Handling drums and containers.**

(1) General.

(a) Hazardous substances and contaminated soils, liquids, and other residues shall be handled, transported, labeled, and disposed of in accordance with this section.

(b) Drums and containers used during the clean-up shall meet the appropriate DOT, OSHA, WISHA, and EPA regulations for the wastes that they contain.

(c) When practical, drums and containers shall be inspected and their integrity shall be assured prior to being moved. Drums or containers that cannot be inspected

before being moved because of storage conditions (i.e., buried beneath the earth, stacked behind other drums, stacked several tiers high in a pile, etc.) shall be moved to an accessible location and inspected prior to further handling.

(d) Unlabeled drums and containers shall be considered to contain hazardous substances and handled accordingly until the contents are positively identified and labeled.

(e) Site operations shall be organized to minimize the amount of drum or container movement.

(f) Prior to movement of drums or containers, all employees exposed to the transfer operation shall be warned of the potential hazards associated with the contents of the drums or containers.

(g) United States Department of Transportation specified salvage drums or containers and suitable quantities of proper absorbent shall be kept available and used in areas where spills, leaks, or ruptures may occur.

(h) Where major spills may occur, a spill containment program, which is part of the employer's safety and health program required in WAC 296-62-3010, shall be implemented to contain and isolate the entire volume of the hazardous substance being transferred.

(i) Drums and containers that cannot be moved without rupture, leakage, or spillage shall be emptied into a sound container using a device classified for the material being transferred.

(j) A ground-penetrating system or other type of detection system or device shall be used to estimate the location and depth of buried drums or containers.

(k) Soil or covering material shall be removed with caution to prevent drum or container rupture.

(l) Fire extinguishing equipment meeting the requirements of Part G of chapter 296-24 WAC shall be on hand and ready for use to control incipient fires.

(2) Opening drums and containers. The following procedures shall be followed in areas where drums or containers are being opened:

(a) Where an airline respirator system is used, connections to the source of air supply shall be protected from contamination and the entire system shall be protected from physical damage.

(b) Employees not actually involved in opening drums or containers shall be kept a safe distance from the drums or containers being opened.

(c) If employees must work near or adjacent to drums or containers being opened, a suitable shield that does not interfere with the work operation shall be placed between the employee and the drums or containers being opened to protect the employee in case of accidental explosion.

(d) Controls for drum or container opening equipment, monitoring equipment, and fire suppression equipment shall be located behind the explosion-resistant barrier.

(e) When there is a reasonable possibility of flammable atmospheres being present, material handling equipment and hand tools shall be of the type to prevent sources of ignition.



(f) Drums and containers shall be opened in such a manner that excess interior pressure will be safely relieved. If pressure cannot be relieved from a remote location, appropriate shielding shall be placed between the employee and the drums or containers to reduce the risk of employee injury.

(g) Employees shall not stand upon or work from drums or containers.

(3) Material handling equipment. Material handling equipment used to transfer drums and containers shall be selected, positioned, and operated to minimize sources of ignition related to the equipment from igniting vapors released from ruptured drums or containers.

(4) Radioactive wastes. Drums and containers containing radioactive wastes shall not be handled until such time as their hazard to employees is properly assessed.

(5) Shock-sensitive wastes.

As a minimum, the following special precautions shall be taken when drums and containers containing or suspected of containing shock-sensitive wastes are handled:

(a) All nonessential employees shall be evacuated from the area of transfer.

(b) Material handling equipment shall be provided with explosive containment devices or protective shields to protect equipment operators from exploding containers.

(c) An employee alarm system capable of being perceived above surrounding light and noise conditions shall be used to signal the commencement and completion of explosive waste handling activities.

(d) Continuous communications (i.e., portable radios, hand signals, telephones, as appropriate) shall be maintained between the employee-in-charge of the immediate handling area and the site safety and health supervisor or command post until such time as the handling operation is completed. Communication equipment or methods that could cause shock-sensitive materials to explode shall not be used.

(e) Drums and containers under pressure, as evidenced by bulging or swelling, shall not be moved until such time as the cause for excess pressure is determined and appropriate containment procedures have been implemented to protect employees from explosive relief of the drum.

(f) Drums and containers containing packaged laboratory wastes shall be considered to contain shock-sensitive or explosive materials until they have been characterized.

Caution: Shipping of shock-sensitive wastes may be prohibited under United States Department of Transportation regulations. Employers and their shippers should refer to WAC 480-12-195.

(6) Laboratory waste packs. In addition to the requirements of subsection (4) of this section, the following precautions shall be taken, as a minimum, in handling laboratory waste packs (lab packs):

(a) Lab packs shall be opened only when necessary and then only by an individual knowledgeable in the inspection, classification, and segregation of the containers within the pack according to the hazards of the wastes.

(b) If crystalline material is noted on any container, the contents shall be handled as a shock-sensitive waste until the contents are identified.

(7) Sampling of drum and container contents. Sampling of containers and drums shall be done in accordance with a sampling procedure which is part of the site safety and health plan developed for and available to employees and others at the specific worksite.

(8) Shipping and transport.

(a) Drums and containers shall be identified and classified prior to packaging for shipment.

(b) Drum or container staging areas shall be kept to the minimum number necessary to identify and classify materials safely and prepare them for transport.

(c) Staging areas shall be provided with adequate access and egress routes.

(d) Bulking of hazardous wastes shall be permitted only after a thorough characterization of the materials has been completed.

(9) Tank and vault procedures.

(a) Tanks and vaults containing hazardous substances shall be handled in a manner similar to that for drums and containers, taking into consideration the size of the tank or vault.

(b) Appropriate tank or vault entry procedures as described in WAC 296-62-14503 and the employer's safety and health plan shall be followed whenever employees must enter a tank or vault.

[Statutory Authority: Chapter 49.17 RCW. 89-21-018, § 296-62-3090, filed 10/10/89, effective 11/24/89; 88-21-002 (Order 88-23), § 296-62-3090, filed 10/6/88, effective 11/7/88.]

**WAC 296-62-3100 Decontamination.** (1) General. Procedures for all phases of decontamination shall be developed and implemented in accordance with this section.

(2) Decontamination procedures.

(a) A decontamination procedure shall be developed, communicated to employees and implemented before any employees or equipment may enter areas on site where potential for exposure to hazardous substances exists.

(b) Standard operating procedures shall be developed to minimize employee contact with hazardous substances or with equipment that has contacted hazardous substances.

(c) All employees leaving a contaminated area shall be appropriately decontaminated; all contaminated clothing and equipment leaving a contaminated area shall be appropriately disposed of or decontaminated.

(d) Decontamination procedures shall be monitored by the site safety and health supervisor to determine their effectiveness. When such procedures are found to be ineffective, appropriate steps shall be taken to correct any deficiencies.

(3) Location. Decontamination shall be performed in geographical areas that will minimize the exposure of uncontaminated employees or equipment to contaminated employees or equipment.

(4) Equipment and solvents. All equipment and solvents used for decontamination shall be decontaminated or disposed of properly.

(5) Personal protective clothing and equipment.

(a) Protective clothing and equipment shall be decontaminated, cleaned, laundered, maintained, or replaced as needed to maintain their effectiveness.

(b) Employees whose nonimpermeable clothing becomes wetted with hazardous substances shall immediately remove that clothing and proceed to shower. The clothing shall be disposed of or decontaminated before it is removed from the work zone.

(6) Unauthorized employees. Unauthorized employees shall not remove protective clothing or equipment from change rooms.

(7) Commercial laundries or cleaning establishments. Commercial laundries or cleaning establishments that decontaminate protective clothing or equipment shall be informed of the potentially harmful effects of exposures to hazardous substances.

(8) Showers and change rooms. Where the decontamination procedure indicates a need for regular showers and change rooms outside of a contaminated area, they shall be provided and meet the requirements of Part B-1 of chapter 296-24 WAC. If temperature conditions prevent the effective use of water, then other effective means for cleansing shall be provided and used.

[Statutory Authority: Chapter 49.17 RCW. 89-21-018, § 296-62-3100, filed 10/10/89, effective 11/24/89; 88-21-002 (Order 88-23), § 296-62-3100, filed 10/6/88, effective 11/7/88.]

**WAC 296-62-3110 Emergency response by employees at uncontrolled hazardous waste sites.** (1) Emergency response plan.

(a) An emergency response plan shall be developed and implemented by all employers within the scope of this section to handle anticipated emergencies prior to the commencement of hazardous waste operations. The plan shall be in writing and available for inspection and copying by employees, their representatives, WISHA personnel, and other governmental agencies with relevant responsibilities.

(b) Employers who will evacuate their employees from the workplace when an emergency occurs, and who do not permit any of their employees to assist in handling the emergency, respond to assist in handling the emergency are exempt from the requirements of this section if they provide an emergency action plan complying with WAC 296-24-567(1).

(2) Elements of an emergency response plan. The employer shall develop an emergency response plan for emergencies which shall address as a minimum, the following:

(a) Preemergency planning.

(b) Personnel roles, lines of authority, and communication.

(c) Emergency recognition and prevention.

(d) Safe distances and places of refuge.

(e) Site security and control.

(f) Evacuation routes and procedures.

(g) Decontamination procedures which are not covered by the site safety and health plan.

(h) Emergency medical treatment and first aid.

(i) Emergency alerting and response procedures.

(j) Critique of response and follow-up.

(k) PPE and emergency equipment.

(3) Procedures for handling emergency incidents.

(a) In addition to the elements for the emergency response plan required in subsection (2) of this section, the following elements shall be included for emergency response plans:

(i) Site topography, layout, and prevailing weather conditions.

(ii) Procedures for reporting incidents to local, state, and federal governmental agencies.

(b) The emergency response plan shall be a separate section of the site safety and health plan.

(c) The emergency response plan shall be compatible and integrated with the disaster, fire and/or emergency response plans of local, state, and federal agencies.

(d) The emergency response plan shall be rehearsed regularly as part of the overall training program for site operations.

(e) The site emergency response plan shall be reviewed periodically and, as necessary, be amended to keep it current with new or changing site conditions or information.

(f) An employee alarm system shall be installed in accordance with WAC 296-24-631 through 296-24-63199 to notify employees of an on-site emergency situation, to stop work activities if necessary, to lower background noise in order to speed communication, and to begin emergency procedures.

(g) Based upon the information available at the time of the emergency, the employer shall evaluate the incident and the site response capabilities and proceed with the appropriate steps to implement the on-site emergency response plan.

(4) Training program.

(a) New employees. The employer shall develop and implement a training program, which is part of the employer's safety and health program, for employees involved with hazardous waste operations to enable employees to perform their assigned duties and functions in a safe and healthful manner so as not to endanger themselves or other employees. The initial training shall be for 24 hours and refresher training shall be for eight hours annually. Employees who have received the initial training required by this section shall be given a written certificate attesting that they have successfully completed the necessary training.

(b) Current employees. Employers who can show by an employee's previous work experience and/or training that the employee has had training equivalent to the initial training required by this section, shall be considered as meeting the initial training requirements of this section as to that employee. Equivalent training includes the training that existing employees might have already received from actual site work experience. Current employees shall receive eight hours of refresher training annually.



(c) Trainers. Trainers who teach initial training shall have satisfactorily completed a training course for teaching the subjects they are expected to teach or they shall have the academic credentials and instruction experience necessary to demonstrate a good command of the subject matter of the courses and competent instructional skills.

(5) Emergency response program.

(a) Emergency response plan. An emergency response plan shall be developed and implemented by all employers. Such plans need not duplicate any of the subjects fully addressed in the employer's contingency planning required by permits, such as those issued by the United States Environmental Protection Agency, provided that the contingency plan is made part of the emergency response plan. The emergency response plan shall be a written portion of the employer's safety and health program required in this section. Employers who will evacuate their employees from the worksite location when an emergency occurs and who do not permit any of their employees to assist in handling the emergency are exempt from the requirements of WAC 296-62-3140(1) if they provide an emergency action plan complying with WAC 296-24-567.

(b) Elements of an emergency response plan. The employer shall develop an emergency response plan for emergencies which shall address, as a minimum, the following areas to the extent that they are not addressed in any specific program required in this section:

(i) Preemergency planning and coordination with outside parties.

(ii) Personnel roles, lines of authority, and communication.

(iii) Emergency recognition and prevention.

(iv) Safe distances and places of refuge.

(v) Site security and control.

(vi) Evacuation routes and procedures.

(vii) Decontamination procedures.

(viii) Emergency medical treatment and first aid.

(ix) Emergency alerting and response procedures.

(x) Critique of response and follow-up.

(xi) PPE and emergency equipment.

(c) Training.

(i) Training for emergency response employees shall be completed before they are called upon to perform in real emergencies. Such training shall include the elements of the emergency response plan, standard operating procedures the employer has established for the job, the personal protective equipment to be worn, and procedures for handling emergency incidents.

Exception #1: An employer need not train all employees to the degree specified if the employer divides the workforce in a manner such that a sufficient number of employees who have responsibility to control emergencies have the training specified, and all other employees, who may first respond to an emergency incident, have sufficient awareness training to recognize that an emergency response situation exists and that they are instructed in that case to summon the fully trained employees and not attempt to control activities for which they are not trained.

Exception #2: An employer need not train all employees to the degree specified if arrangements have been made in advance for an outside fully trained emergency response team to respond in a reasonable period and all employees, who may come to the incident first, have sufficient awareness training to recognize that an emergency response situation exists and they have been instructed to call the designated outside fully trained emergency response team for assistance.

(ii) Employee members of TSD facility emergency response organizations shall be trained to a level of competence in the recognition of health and safety hazards to protect themselves and other employees. This would include training in the methods used to minimize the risk from safety and health hazards; in the safe use of control equipment; in the selection and use of appropriate personal protective equipment; in the safe operating procedures to be used at the incident scene; in the techniques of coordination with other employees to minimize risks; in the appropriate response to over exposure from health hazards or injury to themselves and other employees; and in the recognition of subsequent symptoms which may result from over exposures.

(iii) The employer shall certify that each covered employee has attended and successfully completed the training required in this subsection, or shall certify the employee's competency at least yearly. The method used to demonstrate competency for certification of training shall be recorded and maintained by the employer.

(d) Procedures for handling emergency incidents.

(i) In addition to the elements for the emergency response plan required in (b) of this subsection, the following elements shall be included for emergency response plans to the extent that they do not repeat any information already contained in the emergency response plan:

(A) Site topography, layout, and prevailing weather conditions.

(B) Procedures for reporting incidents to local, state, and federal governmental agencies.

(ii) The emergency response plan shall be compatible and integrated with the disaster, fire, and/or emergency response plans of local, state, and federal agencies.

(iii) The emergency response plan shall be rehearsed regularly as part of the overall training program for site operations.

(iv) The site emergency response plan shall be reviewed periodically and, as necessary, be amended to keep it current with new or changing site conditions or information.

(v) An employee alarm system shall be installed in accordance with WAC 296-24-631 to notify employees of an emergency situation; to stop work activities if necessary; to lower background noise in order to speed communication; and to begin emergency procedures.

(vi) Based upon the information available at time of the emergency, the employer shall evaluate the incident and the site response capabilities and proceed with the appropriate steps to implement the site emergency response plan.

[Statutory Authority: Chapter 49.17 RCW. 89-21-018 (Order 89-10), § 296-62-3110, filed 10/10/89, effective 11/24/89; 88-21-002 (Order 88-23), § 296-62-3110, filed 10/6/88, effective 11/7/88.]

**WAC 296-62-3112 Emergency response to hazardous substance releases.** This section covers employers whose employees are engaged in emergency response no matter where it occurs except that it does not cover employees engaged in operations specified in WAC 296-62-300 (1)(a) through (d).

Those emergency response organizations who have developed and implemented programs equivalent to this section for handling releases of hazardous substances pursuant to Section 303 of SARA Title III shall be deemed to have met the requirements of this section.

(1) Emergency response plan. An emergency response plan shall be developed and implemented to handle anticipated emergencies prior to the commencement of emergency response operations. The plan shall be in writing and available for inspection and copying by employees, their representatives, and WISHA personnel. Employers who will evacuate their employees from the workplace when an emergency occurs, and who do not permit any of their employees to assist in handling the emergency, are exempt from the requirements of this section if they provide an emergency action plan in accordance with WAC 296-24-567(1).

(2) Elements of an emergency response plan. The employer shall develop an emergency response plan for emergencies which shall address, as a minimum, the following to the extent that they are not addressed elsewhere:

(a) Preemergency planning and coordination with outside parties.

(b) Personnel roles, lines of authority, training, and communication.

(c) Emergency recognition and prevention.

(d) Safe distances and places of refuge.

(e) Site security and control.

(f) Evacuation routes and procedures.

(g) Decontamination.

(h) Emergency medical treatment and first aid.

(i) Emergency alerting and response procedures.

(j) Critique of response and follow-up.

(k) PPE and emergency equipment.

(l) Emergency response organizations may use the local emergency response plan or the state emergency response plan or both, as part of their emergency response plan to avoid duplication. Those items of the emergency response plan that are being properly addressed by the SARA Title III plans may be substituted into their emergency plan or otherwise kept together for the employer and employee's use.

(3) Procedures for handling emergency response.

(a) The senior emergency response official responding to an emergency shall become the individual in charge of a site-specific incident command system (ICS). All emergency responders and their communications shall be coordinated and controlled through the individual in charge of the ICS assisted by the senior official present for each employer.

Note: The "senior official" at an emergency response is the most senior official on the site who has the responsibility for controlling the operations at the site. Initially it is the senior officer on the first-due piece of responding emergency apparatus to arrive on the incident scene. As more senior officers arrive (i.e., battalion chief, fire chief, state law enforcement official, site coordinator, etc.), the position is passed up the line of authority which has been previously established.

(b) The individual in charge of the ICS shall identify, to the extent possible, all hazardous substances or conditions present and shall address as appropriate site analysis, use of engineering controls, maximum exposure limits, hazardous substance handling procedures, and use of any new technologies.

(c) Based on the hazardous substances and/or conditions present, the individual in charge of the ICS shall implement appropriate emergency operations, and assure that the personal protective equipment worn is appropriate for the hazards to be encountered. However, personal protective equipment shall meet, at a minimum, the criteria contained in WAC 296-24-58513 when worn while performing fire fighting operations beyond the incipient stage for any incident or site.

(d) Employees engaged in emergency response and exposed to hazardous substances presenting an inhalation hazard or potential inhalation hazard shall wear positive pressure self-contained breathing apparatus while engaged in emergency response, until such time that the individual in charge of the ICS determines through the use of air monitoring that a decreased level of respiratory protection will not result in hazardous exposures to employees.

(e) The individual in charge of the ICS shall limit the number of emergency response personnel at the emergency site, in those areas of potential or actual exposure to incident or site hazards, to those who are actively performing emergency operations. However, operations in hazardous areas shall be performed using the buddy system in groups of two or more.

(f) Back-up personnel shall stand by with equipment ready to provide assistance or rescue. Advance first-aid support personnel, as a minimum, shall also stand by with medical equipment and transportation capability.

(g) The individual in charge of the ICS shall designate a safety official, who is knowledgeable in the operations being implemented at the emergency response site, with specific responsibility to identify and evaluate hazards and to provide direction with respect to the safety of operations for the emergency at hand.

(h) When activities are judged by the safety official to be an IDLH condition and/or to involve an imminent danger condition, the safety official shall have the authority to alter, suspend, or terminate those activities. The safety official shall immediately inform the individual in charge of the ICS of any actions needed to be taken to correct these hazards at an emergency scene.

(i) After emergency operations have terminated, the individual in charge of the ICS shall implement appropriate decontamination procedures.

(j) When deemed necessary for meeting the tasks at hand, approved self-contained compressed air breathing apparatus may be used with approved cylinders from

other approved self-contained compressed air breathing apparatus provided that such cylinders are of the same capacity and pressure rating. All compressed air cylinders used with self-contained breathing apparatus shall meet United States Department of Transportation and National Institute for Occupational Safety and Health criteria.

(4) Skilled support personnel. Personnel, not necessarily an employer's own employees, who are skilled in the operation of certain equipment, such as mechanized earth moving or digging equipment or crane and hoisting equipment, and who are needed temporarily to perform immediate emergency support work that cannot reasonably be performed in a timely fashion by an employer's own employees, and who will be or may be exposed to the hazards at an emergency response scene, are not required to meet the training required in this subsection for the employer's regular employees. However, these personnel shall be given an initial briefing at the site prior to their participation in any emergency response. The initial briefing shall include instruction in the wearing of appropriate personal protective equipment, what chemical hazards are involved, and what duties are to be performed. All other appropriate safety and health precautions provided to the employer's own employees shall be used to assure the safety and health of these personnel.

(5) Specialist employees. Employees who, in the course of their regular job duties, work with and are trained in the hazards of specific hazardous substances, and who will be called upon to provide technical advice or assistance at a hazardous substance release incident to the individual in charge, shall receive training or demonstrate competency in the area of their specialization annually.

(6) Training. Training shall be based on the duties and functions to be performed by each responder of an emergency response organization. The skill and knowledge levels required for all new responders, those hired after the effective date of this standard, shall be conveyed to them through training before they are permitted to take part in actual emergency operations on an incident.

Employees who participate, or are expected to participate, in emergency response, shall be given training in accordance with the following:

(a) First responder awareness level. First responders at the awareness level are individuals who are likely to witness or discover a hazardous substance release and who have been trained to initiate an emergency response sequence by notifying the proper authorities of the release. They would take no further action beyond notifying the authorities of the release. First responders at the awareness level shall have sufficient training or have had sufficient experience to objectively demonstrate competency in the following areas:

(i) An understanding of what hazardous materials are and the risks associated with them in an incident.

(ii) An understanding of the potential outcomes associated with an emergency created when hazardous materials are present.

(iii) The ability to recognize the presence of hazardous materials in an emergency.

(iv) The ability to identify the hazardous materials, if possible.

(v) An understanding of the role of the first responder awareness individual in the employer's emergency response plan including site security and control and the United States Department of Transportation's Emergency Response Guidebook.

(vi) The ability to realize the need for additional resources and to make appropriate notifications to the communication center.

(b) First responder operations level. First responders at the operations level are individuals who respond to releases or potential releases of hazardous substances as part of the initial response to the site for the purpose of protecting nearby persons, property, or the environment from the effects of the release. They are trained to respond in a defensive fashion without actually trying to stop the release. Their function is to contain the release from a safe distance, keep it from spreading, and protect exposures. First responders at the operational level shall have received at least eight hours of training or have had sufficient experience to objectively demonstrate competency in the following areas in addition to those listed for the awareness level and the employer shall so certify:

(i) Knowledge of the basic hazard and risk assessment techniques.

(ii) Know how to select and use proper personal protective equipment provided to the first responder operational level.

(iii) An understanding of basic hazardous materials terms.

(iv) Know how to perform basic control, containment, and/or confinement operations within the capabilities of the resources and personal protective equipment available with their unit.

(v) Know how to implement basic decontamination procedures.

(vi) An understanding of the relevant standard operating procedures and termination procedures.

(c) Hazardous materials technician. Hazardous materials technicians are individuals who respond to releases or potential releases for the purpose of stopping the release. They assume a more aggressive role than a first responder at the operations level in that they will approach the point of release in order to plug, patch, or otherwise stop the release of hazardous substance. Hazardous materials technicians shall have received at least 24 hours of training equal to the first responder operations level and in addition have competency in the following areas and the employer shall so certify:

(i) Know how to implement the employer's emergency response plan.

(ii) Know the classification, identification, and verification of known and unknown materials by using field survey instruments and equipment.

(iii) Be able to function within an assigned role in the incident command system.

(iv) Know how to select and use proper specialized chemical personal protective equipment provided to the hazardous materials technician.

(v) Understand hazard and risk assessment techniques.

(vi) Be able to perform advance control, containment, and/or confinement operations within the capabilities of the resources and personal protective equipment available with the unit.

(vii) Understand and implement decontamination procedures.

(viii) Understand termination procedures.

(ix) Understand basic chemical and toxicological terminology and behavior.

(d) Hazardous materials specialist. Hazardous materials specialists are individuals who respond with and provide support to hazardous materials technicians. Their duties parallel those of the hazardous materials technician, however, those duties require a more directed or specific knowledge of the various substances they may be called upon to contain. The hazardous materials specialist would also act as the site liaison with federal, state, local, and other government authorities in regard to site activities.

Hazardous materials specialists shall have received at least 24 hours of training equal to the technician level and in addition have competency in the following areas and the employer shall so certify:

(i) Know how to implement the local emergency response plan.

(ii) Understand classification, identification, and verification of known and unknown materials by using advanced survey instruments and equipment.

(iii) Know of the state emergency response plan.

(iv) Be able to select and use proper specialized chemical personal protective equipment provided to the hazardous materials specialist.

(v) Understand in-depth hazard and risk techniques.

(vi) Be able to perform specialized control, containment, and/or confinement operations within the capabilities of the resources and personal protective equipment available.

(vii) Be able to determine and implement decontamination procedures.

(viii) Have the ability to develop a site safety and control plan.

(ix) Understand chemical, radiological, and toxicological terminology and behavior.

(e) On scene incident commander. Incident commanders, who will assume control of the incident scene beyond the first responder awareness level, shall receive at least 24 hours of training equal to the first responder operations level and in addition have competency in the following areas and the employer shall so certify:

(i) Know and be able to implement the employer's incident command system.

(ii) Know how to implement the employer's emergency response plan.

(iii) Know and understand the hazards and risks associated with employees working in chemical protective clothing.

(iv) Know how to implement the local emergency response plan.

(v) Know of the state emergency response plan and of the Federal Regional Response Team.

(vi) Know and understand the importance of decontamination procedures.

(7) Trainers. Trainers who teach any of the above training subjects shall have satisfactorily completed a training course for teaching the subjects they are expected to teach, such as the courses offered by the United States Fire Academy, or they shall have the training and/or academic credentials and instructional experience necessary to demonstrate competent instructional skills and a good command of the subject matter of the courses they are to teach.

(8) Refresher training.

(a) Those employees who are trained in accordance with subsection (6) of this section shall receive annual refresher training of sufficient content and duration to maintain their competencies, or shall demonstrate competency in those areas at least yearly.

(b) A statement shall be made of the training or competency, and if a statement of competency is made, the employer shall keep a record of the methodology used to demonstrate competency.

(9) Medical surveillance and consultation.

(a) Members of an organized and designated HAZMAT team and hazardous materials specialists shall receive a baseline physical examination and be provided with medical surveillance as required in WAC 296-62-3050.

(b) Any emergency response employees who exhibit signs or symptoms which may have resulted from exposure to hazardous substances during the course of an emergency incident, either immediately or subsequently, shall be provided with medical consultation as required in WAC 296-62-3050 (3)(b).

(10) Chemical protective clothing. Chemical protective clothing and equipment to be used by organized and designated HAZMAT team members, or to be used by hazardous materials specialists, shall meet the requirements of WAC 296-62-3060 (3) through (5).

(11) Postemergency response operations. Upon completion of the emergency response, if it is determined that it is necessary to remove hazardous substances, health hazards, and materials contaminated with them (such as contaminated soil or other elements of the natural environment) from the site of the incident, the employer conducting the clean-up shall comply with one of the following:

(a) Meet all of the requirements of WAC 296-62-3010, 296-62-3020, 296-62-3030, 296-62-3040, 296-62-3050, 296-62-3060, 296-62-3070, 296-62-3080, 296-62-3090, 296-62-3100, 296-62-3110, 296-62-3120, 296-62-3130, and 296-62-3138; or

(b) Where the clean-up is done on plant property using plant or workplace employees, such employees shall have completed the training requirements of WAC 296-24-567(1), 296-62-071, and 296-62-054, and other appropriate safety and health training made necessary by the tasks that they are expected to be performed such as

personal protective equipment and decontamination procedures. All equipment to be used in the performance of the clean-up work shall be in serviceable condition and shall have been inspected prior to use.

[Statutory Authority: Chapter 49.17 RCW. 89-21-018, § 296-62-3112, filed 10/10/89, effective 11/24/89.]

**WAC 296-62-3120 Illumination.** Areas accessible to employees shall be lighted to not less than the minimum illumination intensities listed in Table 1 while any work is in progress:

TABLE 1 - 120.1 — MINIMUM ILLUMINATION Intensities in Foot-Candles

Foot-candles	Area or operation
5	General site area.
3	Excavation and waste areas, accessways, active storage areas, loading platforms, refueling, and field maintenance areas.
5	Indoors: Warehouses, corridors, hallways, and exitways.
5	Tunnels, shafts, and general underground work areas; exception: Minimum of ten foot-candles is required at tunnel and shaft heading during drilling, mucking, and scaling. Bureau of Mines approved cap lights shall be acceptable for use in the tunnel heading.
10	General shops (e.g., mechanical and electrical equipment rooms, active storerooms, barracks or living quarters, locker or dressing rooms, dining areas, and indoor toilets and workrooms).
30	First aid stations, infirmaries, and offices.

[Statutory Authority: Chapter 49.17 RCW. 89-21-018, § 296-62-3120, filed 10/10/89, effective 11/24/89; 88-21-002 (Order 88-23), § 296-62-3120, filed 10/6/88, effective 11/7/88.]

**WAC 296-62-3130 Sanitation at temporary workplaces.** (1) Potable water.

(a) An adequate supply of potable water shall be provided on the site.

(b) Portable containers used to dispense drinking water shall be capable of being tightly closed, and equipped with a tap. Water shall not be dipped from containers.

(c) Any container used to distribute drinking water shall be clearly marked as to the nature of its contents and not used for any other purpose.

(d) Where single service cups (to be used but once) are supplied, both a sanitary container for the unused cups and a receptacle for disposing of the used cups shall be provided.

(2) Nonpotable water.

(a) Outlets for nonpotable water, such as water for fire fighting purposes shall be identified to indicate

clearly that the water is unsafe and is not to be used for drinking, washing, or cooking purposes.

(b) There shall be no cross-connection, open or potential, between a system furnishing potable water and a system furnishing nonpotable water.

(3) Toilet facilities.

(a) Toilets shall be provided for employees according to Table 2.

TABLE 2 — TOILET FACILITIES

Number of employees	Minimum number of facilities
20 or fewer	One.
More than 20, fewer than 200	One toilet seat and one urinal per 40 employees.
More than 200	One toilet seat and one urinal per 50 employees.

(b) Under temporary field conditions, provisions shall be made to assure that at least one toilet facility is available.

(c) Hazardous waste sites, not provided with a sanitary sewer shall be provided with the following toilet facilities unless prohibited by local codes:

- (i) Chemical toilets;
- (ii) Recirculating toilets;
- (iii) Combustion toilets; or
- (iv) Flush toilets.

(d) The requirements of this section for sanitation facilities shall not apply to mobile crews having transportation readily available to nearby toilet facilities.

(e) Doors entering toilet facilities shall be provided with entrance locks controlled from inside the facility.

(4) Food handling. All food service facilities and operations for employees shall meet the applicable laws, ordinances, and regulations of the jurisdictions in which they are located.

(5) Temporary sleeping quarters. When temporary sleeping quarters are provided, they shall be heated, ventilated, and lighted.

(6) Washing facilities. The employer shall provide adequate washing facilities for employees engaged in operations where hazardous substances may be harmful to employees. Such facilities shall be in near proximity to the worksite, in areas where exposures are below permissible exposure limits and published exposure levels and which are under the controls of the employer, and shall be so equipped as to enable employees to remove hazardous substances from themselves.

(7) Showers and change rooms. When hazardous waste clean-up or removal operations commence on a site and the duration of the work will require six months or greater time to complete, the employer shall provide showers and change rooms for all employees exposed to hazardous substances and health hazards involved in hazardous waste clean-up or removal operations.

(a) Showers shall be provided and shall meet the requirements of WAC 296-24-12009(3).

(b) Change rooms shall be provided and shall meet the requirements of WAC 296-24-12011. Change rooms shall consist of two separate change areas separated by the shower area required in (a) of this subsection. One change area, with an exit leading off the worksite, shall provide employees with a clean area where they can remove, store, and put on street clothing. The second area, with an exit to the worksite, shall provide employees with an area where they can put on, remove and store work clothing and personal protective equipment.

(c) Showers and change rooms shall be located in areas where exposures are below the permissible exposure limits and published exposure levels. If this cannot be accomplished, then a ventilation system shall be provided that will supply air that is below the permissible exposure limits and published exposure levels.

(d) Employers shall assure that employees shower at the end of their work shift and when leaving the hazardous waste site.

[Statutory Authority: Chapter 49.17 RCW. 89-21-018, § 296-62-3130, filed 10/10/89, effective 11/24/89; 88-21-002 (Order 88-23), § 296-62-3130, filed 10/6/88, effective 11/7/88.]

**WAC 296-62-3138 New technology programs.** (1) The employer shall develop and implement procedures for the introduction of effective new technologies and equipment developed for the improved protection of employees working with hazardous waste clean-up operations, and the same shall be implemented as part of the site safety and health program to assure that employee protection is being maintained.

(2) New technologies, equipment or control measures available to the industry, such as the use of foams, absorbents, adsorbents, neutralizers, or other means to suppress the level of air contaminants while excavating the site or for spill control, shall be evaluated by employers or their representatives. Such an evaluation shall be done to determine the effectiveness of the new methods, materials, or equipment before implementing their use on a large scale for enhancing employee protection. Information and data from manufacturers or suppliers may be used as part of the employer's evaluation effort. Such evaluations shall be made available to WISHA upon request.

[Statutory Authority: Chapter 49.17 RCW. 89-21-018, § 296-62-3138, filed 10/10/89, effective 11/24/89.]

**WAC 296-62-3140 Certain operations conducted under the Resource Conservation and Recovery Act of 1976 (RCRA).** Employers conducting operations at treatment, storage, and disposal (TSD) facilities specified in WAC 296-62-300 (3)(c) not exempted by WAC 296-62-300 (2)(c) shall provide and implement the programs specified in this section.

(1) Safety and health program. The employer shall develop and implement a written safety and health program for employees involved in hazardous waste operations that shall be available for inspection by employees, their representatives and WISHA personnel. The program shall be designed to identify, evaluate and control

safety and health hazards in their facilities for the purpose of employee protection, to provide for emergency response meeting the requirements of WAC 296-62-3110 and to address as appropriate site analysis, engineering controls, maximum exposure limits, hazardous waste handling procedures and uses of new technologies.

(2) Hazard communication program. The employer shall implement a hazard communication program meeting the requirements of WAC 296-62-054 through 296-62-05427 as part of the employer's safety and health program.

Note: The exemption for hazardous waste provided in WAC 296-62-054 is applicable to this section.

(3) Medical surveillance program. The employer shall develop and implement a medical surveillance program meeting the requirements of WAC 296-62-3050.

(4) Decontamination program. The employer shall develop and implement a decontamination procedure meeting the requirements of WAC 296-62-3100.

(5) New technology programs. The employer shall develop and implement procedures meeting the requirements of WAC 296-62-3138 for introducing new and innovative equipment into the workplace.

(6) Material handling program. Where employees will be handling drums or containers, the employer shall develop and implement procedures meeting the requirements of WAC 296-62-3090 (1)(b) through (h) and (k), as well as WAC 296-62-3090 (3) and (8), prior to starting such work.

[Statutory Authority: Chapter 49.17 RCW. 89-21-018, § 296-62-3140, filed 10/10/89, effective 11/24/89; 88-21-002 (Order 88-23), § 296-62-3140, filed 10/6/88, effective 11/7/88.]

#### **WAC 296-62-3152 Appendices to Part P--Hazardous waste operations and emergency response.**

Note: The following appendices serve as nonmandatory guidelines to assist employees and employers in complying with the appropriate requirements of this part. However, WAC 296-62-3060 makes mandatory in certain circumstances the use of Level A and Level B personal protective equipment protection.

[Statutory Authority: Chapter 49.17 RCW. 89-21-018, § 296-62-3152, filed 10/10/89, effective 11/24/89; 88-21-002 (Order 88-23), § 296-62-3152, filed 10/6/88, effective 11/7/88.]

**WAC 296-62-3160 Appendix A--Personal protective equipment test methods.** This appendix sets forth the nonmandatory examples of tests which may be used to evaluate compliance with WAC 296-62-3060. Other tests and other challenge agents may be used to evaluate compliance.

(1) Totally-encapsulating chemical protective suit pressure test.

(a) Scope.

(i) This practice measures the ability of a gas tight totally-encapsulating chemical protective suit material, seams, and closures to maintain a fixed positive pressure. The results of this practice allow the gas tight integrity of a total-encapsulating chemical protective suit to be evaluated.



(ii) Resistance of the suit materials to permeation, penetration, and degradation by specific hazardous substances is not determined by this test method.

(b) Description of terms.

(i) "Totally-encapsulated chemical protective suit (TECP suit)" means a full body garment which is constructed of protective clothing materials; covers the wearer's torso, head, arms, and legs; may cover the wearer's hands and feet with tightly attached gloves and boots; completely encloses the wearer and respirator by itself or in combination with the wearer's gloves and boots.

(ii) "Protective clothing material" means any material or combination of materials used in an item of clothing for the purpose of isolating parts of the body from direct contact with a potentially hazardous liquid or gaseous chemicals.

(iii) "Gas tight" means for the purpose of this test method the limited flow of a gas under pressure from the inside of a TECP suit to atmosphere at a prescribed pressure and time interval.

(c) Summary of test method. The TECP suit is visually inspected and modified for the test. The test apparatus is attached to the suit to permit inflation to the pretest suit expansion pressure for removal of suit wrinkles and creases. The pressure is lowered to the test pressure and monitored for three minutes. If the pressure drop is excessive, the TECP suit fails the test and is removed from service. The test is repeated after leak location and repair.

(d) Required supplies.

(i) Source of compressed air.

(ii) Test apparatus for suit testing including a pressure measurement device with a sensitivity of at least 1/4 inch water gauge.

(iii) Vent valve closure plugs or sealing tape.

(vi) Soapy water solution and soft brush.

(v) Stop watch or appropriate timing device.

(e) Safety precautions. Care shall be taken to provide the correct pressure safety devices required for the source of compressed air used.

(f) Test procedure. Prior to each test, the tester shall perform a visual inspection of the suit. Check the suit for seam integrity by visually examining the seams and gently pulling on the seams. Ensure that all air supply lines, fittings, visor, zippers, and valves are secure and show no signs of deterioration.

(i) Seal off the vent valves along with any other normal inlet or exhaust points (such as umbilical air line fittings or facepiece opening) with tape or other appropriate means (caps, plugs, fixture, etc.). Care should be exercised in the sealing process not to damage any of the suit components.

(ii) Close all closure assemblies.

(iii) Prepare the suit for inflation by providing an improvised connection point on the suit for connecting an airline. Attach the pressure test apparatus to the suit to permit suit inflation from a compressed air source equipped with a pressure indicating regulator. The leak tightness of the pressure test apparatus should be tested before and after each test by closing off the end of the

tubing attached to the suit and assuring a pressure of three inches water gauge for three minutes can be maintained. If a component is removed for the test, that component shall be replaced and a second test conducted with another component removed to permit a complete test of the ensemble.

(iv) The pretest expansion pressure (A) and the suit test pressure (B) shall be supplied by the suit manufacturer, but in no case shall they be less than (A) = 3 inches water gauge and (B) = 2 inches water gauge. The ending suit pressure (C) shall be no less than eighty percent of the test pressure (B); i.e., the pressure drop shall not exceed twenty percent of the test pressure (B).

(v) Inflate the suit until the pressure inside is equal to pressure (A), the pretest expansion suit pressure. Allow at least one minute to fill out the wrinkles in the suit. Release sufficient air to reduce the suit pressure to pressure (B), the suit test pressure. Begin timing. At the end of three minutes, record the suit pressure as pressure (C), the ending suit pressure. The difference between the suit test pressure and the ending suit test pressure (B)-(C) shall be defined as the suit pressure drop.

(vi) If the suit pressure drop is more than twenty percent of the suit test pressure (B) during the three minute test period, the suit fails the test and shall be removed from service.

(g) Retest procedure.

(i) If the suit fails the test check for leaks by inflating the suit to pressure (A) and brushing or wiping the entire suit (including seams, closures, lens gaskets, glove-to-sleeve joints, etc.) with a mild soap and water solution. Observe the suit for the formation of soap bubbles, which is an indication of a leak. Repair all identified leaks.

(ii) Retest the TECP suit as outlined in (f) of this subsection.

(h) Report. Each TECP suit tested by this practice shall have the following information recorded.

(i) Unique identification number, identifying brand name, date of purchase, material of construction, and unique fit features; e.g., special breathing apparatus.

(ii) The actual values for test pressures (A), (B), and (C) shall be recorded along with the specific observation times. If the ending pressure (C) is less than eighty percent of the test pressure (B), the suit shall be identified as failing the test. When possible, the specific leak location shall be identified in the test records. Retest pressure data shall be recorded as an additional test.

(iii) The source of the test apparatus used shall be identified and the sensitivity of the pressure gauge shall be recorded.

(iv) Records shall be kept for each pressure test even if repairs are being made at the test location.

Caution. Visually inspect all parts of the suit to be sure they are positioned correctly and secured tightly before putting the suit back into service. Special care should be taken to examine each exhaust valve to make sure it is not blocked. Care should also be exercised to assure that the inside and outside of the suit is completely dry before it is put into storage.



(2) Totally-encapsulating chemical protective suit qualitative leak test.

(a) Scope.

(i) This practice semiquantitatively tests gas tight totally-encapsulating chemical protective suit integrity by detecting inward leakage of ammonia vapor. Since no modifications are made to the suit to carry out this test, the results from this practice provide a realistic test for the integrity of the entire suit.

(ii) Resistance of the suit materials to permeation, penetration, and degradation is not determined by this test method. ASTM test methods are available to test suit materials for those characteristics and the tests are usually conducted by the manufacturers of the suits.

(b) Definition of terms.

(i) "Totally-encapsulated chemical protective suit (TECP suit)" means a full body garment which is constructed of protective clothing materials; covers the wearer's torso, head, arms, and legs; may cover the wearer's hands and feet with tightly attached gloves and boots; completely encloses the wearer and respirator by itself or in combination with the wearer's gloves and boots.

(ii) "Protective clothing material" means any material or combination of materials used in an item of clothing for the purpose of isolating parts of the body from direct contact with a potentially hazardous liquid or gaseous chemicals.

(iii) "Gas tight" means for the purpose of this test method the limited flow of a gas under pressure from the inside of a TECP suit to atmosphere at a prescribed pressure and time interval.

(iv) "Intrusion coefficient." A number expressing the level of protection provided by a gas tight totally-encapsulating chemical protective suit. The intrusion coefficient is calculated by dividing the test room challenge agent concentration by the concentration of challenge agent found inside the suit. The accuracy of the intrusion coefficient is dependent on the challenge agent monitoring methods. The larger the intrusion coefficient, the greater the protection provided by the TECP suit.

(c) Summary of recommended practice. The volume of concentrated aqueous ammonia solution (ammonia hydroxide,  $\text{NH}_4\text{OH}$ ) required to generate the test atmosphere is determined using the directions outlined in WAC 296-62-3190 (2)(f)(i). The suit is donned by a person wearing the appropriate respiratory equipment (either a self-contained breathing apparatus or a supplied air respirator) and worn inside the enclosed test room. The concentrated aqueous ammonia solution is taken by the suited individual into the test room and poured into an open plastic pan. A two-minute evaporation period is observed before the test room concentration is measured using a high range ammonia length of stain detector tube. When the ammonia reaches a concentration of between 1000 and 1200 ppm, the suited individual starts a standardized exercise protocol to stress and flex the suit. After this protocol is completed the test room concentration is measured again. The suited individual exits the test room and his stand-by person measures the ammonia concentration inside the

suit using a low range ammonia length of stain detector tube or other more sensitive ammonia detector. A stand-by person is required to observe the test individual during the test procedure, aid the person in donning and doffing the TECP suit and monitor the suit interior. The intrusion coefficient of the suit can be calculated by dividing the average test area concentration by the interior suit concentration. A colorimetric indicator strip of bromophenol blue is placed on the inside of the suit facepiece lens so that the suited individual is able to detect a color change and know if the suit has a significant leak. If a color change is observed the individual should leave the test room immediately.

(d) Required supplies.

(i) A supply of concentrated ammonia (fifty-eight percent ammonium hydroxide by weight).

(ii) A supply of bromophenol/blue indicating paper, sensitive to 5-10 ppm ammonia or greater over a two-minute period of exposure [pH 3.0 (yellow) to pH 4.6 (blue)].

(iii) A supply of high range (0.5-10 volume percent) and low range (5-700 ppm) detector tubes for ammonia and the corresponding sampling pump. More sensitive ammonia detectors can be substituted for the low range detector tubes to improve the sensitivity of this practice.

(iv) A shallow plastic pan (PVC) at least 12":14":1" and a half pint plastic container (PVC) with tightly closing lid.

(v) A graduated cylinder or other volumetric measuring device of at least fifty milliliters in volume with an accuracy of at least  $\pm 1$  milliliters.

(e) Safety precautions.

(i) Concentrated aqueous ammonium hydroxide,  $\text{NH}_4\text{OH}$  is a corrosive volatile liquid requiring eye, skin, and respiratory protection. The person conducting the test shall review the MSDS for aqueous ammonia.

(ii) Since the established permissible exposure limit for ammonia is 50 ppm, only persons wearing a self-contained breathing apparatus or a supplied air respirator shall be in the chamber. Normally only the person wearing the total-encapsulating suit will be inside the chamber. A stand-by person shall have a self-contained breathing apparatus, or a positive pressure supplied air respirator available to enter the test area should the suited individual need assistance.

(iii) A method to monitor the suited individual must be used during this test. Visual contact is the simplest but other methods using communication devices are acceptable.

(iv) The test room shall be large enough to allow the exercise protocol to be carried out and then to be ventilated to allow for easy exhaust of the ammonia test atmosphere after the test(s) are completed.

(v) Individuals shall be medically screened for the use of respiratory protection and checked for allergies to ammonia before participating in this test procedure.

(f) Test procedure.

(i) Measure the test area to the nearest foot and calculate its volume in cubic feet. Multiply the test area volume by 0.2 milliliters of concentrated aqueous ammonia per cubic foot of test area volume to determine

the approximate volume of concentrated aqueous ammonia required to generate 1000 ppm in the test area.

(A) Measure this volume from the supply of concentrated ammonia and place it into a closed plastic container.

(B) Place the container, several high range ammonia detector tubes and the pump in the clean test pan and locate it near the test area entry door so that the suited individual has easy access to these supplies.

(ii) In a noncontaminated atmosphere, open a presealed ammonia indicator strip and fasten one end of the strip to the inside of the suit face shield lens where it can be seen by the wearer. Moisten the indicator strip with distilled water. Care shall be taken not to contaminate the detector part of the indicator paper by touching it. A small piece of masking tape or equivalent should be used to attach the indicator strip to the interior of the suit face shield.

(iii) If problems are encountered with this method of attachment the indicator strip can be attached to the outside of the respirator facepiece being used during the test.

(iv) Don the respiratory protective device normally used with the suit, and then don the TECP suit to be tested. Check to be sure all openings which are intended to be sealed (zippers, gloves, etc.) are completely sealed. DO NOT, however, plug off any venting valves.

(v) Step into the enclosed test room such as a closet, bathroom, or test booth, equipped with an exhaust fan. No air should be exhausted from the chamber during the test because this will dilute the ammonia challenge concentrations.

(vi) Open the container with the premeasured volume of concentrated aqueous ammonia within the enclosed test room, and pour the liquid into the empty plastic test pan. Wait two minutes to allow for adequate volatilization of the concentrated aqueous ammonia. A small mixing fan can be used near the evaporation pan to increase the evaporation rate of the ammonia solution.

(vii) After two minutes a determination of the ammonia concentration within the chamber should be made using the high range colorimetric detector tube. A concentration of 1000 ppm ammonia or greater shall be generated before the exercises are started.

(viii) To test the integrity of the suit the following four minute exercise protocol should be followed:

(A) Raising the arms above the head with at least fifteen raising motions completed in one minute.

(B) Walking in place for one minute with at least fifteen raising motions of each leg in a one-minute period.

(C) Touching the toes with at least ten complete motions of the arms from above the head to touching of the toes in a one-minute period.

(D) Knee bends with at least ten complete standing and squatting motions in a one-minute period.

(ix) If at any time during the test the colorimetric indicating paper should change colors the test should be stopped and (f)(x) and (xi) of this subsection initiated.

(x) After completion of the test exercise, the test area concentration should be measured again using the high range colorimetric detector tube.

(xi) Exit the test area.

(xii) The opening created by the suit zipper or other appropriate suit penetration should be used to determine the ammonia concentration in the suit with the low range length of stain detector tube or other ammonia monitor. The internal TECP suit air should be sampled far enough from the enclosed test area to prevent a false ammonia reading.

(xiii) After completion of the measurement of the suit interior ammonia concentration the test is concluded and the suit is doffed and the respirator removed.

(xiv) The ventilating fan for the test room should be turned on and allowed to run for enough time to remove the ammonia gas. The fan shall be vented to the outside of the building.

(xv) Any detectable ammonia in the suit interior (5 ppm ammonia (NH<sub>3</sub>) or more for the length of stain detector tube) indicates the suit failed the test. When other ammonia detectors are used, a lower level of detection is possible and it should be specified as the pass/fail criteria.

(xvi) By following this test method an intrusion coefficient of approximately two hundred or more can be measured with the suit in a completely operational condition. If the intrusion coefficient is 200 or more, then the suit is suitable for emergency response and field use.

(g) Retest procedures.

(i) If the suit fails this test, check for leaks by following the pressure test in test (A) above.

(ii) Retest the TECP suit as outlined in the test procedure in (f) of this subsection.

(h) Report.

(i) Each gas tight totally-encapsulating chemical protective suit tested by this practice shall have the following information recorded.

(A) Unique identification number, identifying brand name, date of purchase, material of construction, and unique suit features; e.g., special breathing apparatus.

(B) General description of test room used for test.

(C) Brand name and purchase date of ammonia detector strips and color change data.

(D) Brand name, sampling range, and expiration date of the length of stain ammonia detector tubes. The brand name and model of the sampling pump should also be recorded. If another type of ammonia detector is used, it should be identified along with its minimum detection limit for ammonia.

(E) Actual test results shall list the two test area concentrations, their average, the interior suit concentration, and the calculated intrusion coefficient. Retest data shall be recorded as an additional test.

(ii) The evaluation of the data shall be specified as "suit passed" or "suit failed" and the date of the test. Any detectable ammonia (5 ppm or greater for the length of stain detector tube) in the suit interior indicates the suit fails this test. When other ammonia detectors are used, a lower level of detection is possible and it should be specified as the pass/fail criteria.

Caution. Visually inspect all parts of the suit to be sure they are positioned correctly and secured tightly before putting the suit back into service. Special care

should be taken to examine each exhaust valve to make sure it is not blocked.

Care should also be exercised to assure that the inside and outside of the suit is completely dry before it is put into storage.

[Statutory Authority: Chapter 49.17 RCW. 89-21-018, § 296-62-3160, filed 10/10/89, effective 11/24/89; 88-21-002 (Order 88-23), § 296-62-3160, filed 10/6/88, effective 11/7/88.]

**Reviser's note:** The brackets and enclosed material in the text of the above section occurred in the copy filed by the agency.

**WAC 296-62-3170 Appendix B--General description and discussion of the levels of protection and protective gear.** (1) This appendix sets forth information about personal protective equipment (PPE) protection levels which may be used to assist employers in complying with the PPE requirements of this section.

(2) As required by the standard, PPE must be selected which will protect employees from the specific hazards which they are likely to encounter during their work on-site.

(3) Selection of the appropriate PPE is a complex process which must take into consideration a variety of factors. Key factors involved in this process are identification of the hazards or suspected hazards, their routes of potential hazard to employees (inhalation, skin absorption, ingestion, and eye or skin contact), and the performance of the PPE materials (and seams) in providing a barrier to these hazards. The amount of protection provided by PPE is material-hazard specific. That is, protective equipment materials will protect well against some hazardous substances and poorly, or not at all, against others. In many instances, protective equipment materials cannot be found which will provide continuous protection from the particular hazardous substance. In these cases the breakthrough time of the protective material should exceed the work durations, or the exposure after breakthrough must not pose a hazardous level.

(4) Other factors in this selection process to be considered are matching the PPE to the employee's work requirements and task-specific conditions. The durability of PPE materials, such as tear strength and seam strength, must be considered in relation to the employee's tasks. The effects of PPE in relation to heat stress and task duration are a factor in selecting and using PPE. In some cases layers of PPE may be necessary to provide sufficient protection, or to protect expensive PPE inner garments, suits or equipment.

(5) The more that is known about the hazards at the site, the easier the job of PPE selection becomes. As more information about the hazards and conditions at the site becomes available, the site supervisor can make decisions to up-grade or down-grade the level of PPE protection to match the tasks at hand.

(6) The following are guidelines which an employer can use to begin the selection of the appropriate PPE. As noted above, the site information may suggest the use of combinations of PPE selected from the different protection levels (i.e., A, B, C, or D) as being more suitable to the hazards of the work. It should be cautioned that the

listing below does not fully address the performance of the specific PPE material in relation to the specific hazards at the job site, and that PPE selection, evaluation and reselection is an ongoing process until sufficient information about the hazards and PPE performance is obtained.

(7) Personal protective equipment has been divided into four categories based on the degree of protection afforded (see subsection (8) of this section for further explanation of Levels A, B, C, and D hazards):

(a) Level A. To be selected when the greatest level of skin, respiratory, and eye protection is required. The following constitute Level A equipment; it may be used as appropriate:

(i) Positive pressure, full-facepiece self-contained breathing apparatus (SCBA), or positive pressure supplied-air respirator with escape SCBA, approved by the National Institute for Occupational Safety and Health (NIOSH).

(ii) Totally-encapsulating chemical-protective suit.

(iii) Coveralls.\*

(iv) Long underwear.\*

(v) Gloves, outer, chemical-resistant.

(vi) Gloves, inner, chemical-resistant.

(vii) Boots, chemical-resistant steel toe and shank.

(viii) Hard hat (under suit).\*

(ix) Disposable protective suit, gloves, and boots. (Depending on suit construction, may be worn over totally-encapsulating suit.)

\*Optional, as applicable.

(b) Level B. The highest level of respiratory protection is necessary but a lesser level of skin protection is needed. The following constitute Level B equipment; it may be used as appropriate:

(i) Positive pressure, full-facepiece self-contained breathing apparatus (SCBA), or positive pressure supplied-air respirator with escape SCBA (NIOSH approved).

(ii) Hooded chemical-resistant clothing (overalls and long-sleeved jacket, coveralls, one or two-piece chemical-splash suit, disposable chemical-resistant overalls).

(iii) Coveralls.\*

(iv) Gloves, outer, chemical-resistant.

(v) Gloves, inner, chemical-resistant.

(vi) Boots, outer, chemical-resistant steel toe and shank.

(vii) Boot-covers, outer, chemical-resistant (disposable).\*

(viii) Hard hat.

(ix) Face shield.\*

\*Optional, as applicable.

(c) Level C. The concentration(s) and type(s) of airborne substance(s) is known and the criteria for using air purifying respirators are met. The following constitute Level C equipment; it may be used as appropriate.

(i) Full-face or half-mask, air purifying respirators (NIOSH approved).

(ii) Hooded chemical-resistant clothing (overalls; two-piece chemical-splash suit; disposable chemical-resistant overalls).

- (iii) Coveralls.\*
- (iv) Gloves, outer, chemical-resistant.
- (v) Gloves, inner, chemical-resistant.
- (vi) Boots (outer), chemical-resistant steel toe and shank.\*
- (vii) Boot-covers, outer, chemical-resistant (disposable).\*
- (viii) Hard hat.
- (ix) Escape mask.\*
- (x) Face shield.\*

\*Optional, as applicable.

(d) Level D. A work uniform affording minimal protection; Used for nuisance contamination only. The following constitute Level D equipment; it may be used as appropriate.

- (i) Coveralls.
- (ii) Gloves.\*
- (iii) Boots/shoes, chemical-resistant steel toe and shank.
- (iv) Boots, outer, chemical-resistant (disposable).\*
- (v) Safety glasses or chemical splash goggles.\*
- (vi) Hard hat.
- (vii) Escape mask.\*
- (viii) Face shield.\*

\*Optional, as applicable.

(8) Part B. The types of hazards for which Levels A, B, C, and D protection are appropriate are described below:

(a) Level A - Level A protection should be used when:

(i) The hazardous substance has been identified and requires the highest level of protection for skin, eyes, and the respiratory system based on either the measured (or potential for) high concentration of atmospheric vapors, gases, or particulates; or the site operations and work functions involve a high potential for splash, immersion, or exposure to unexpected vapors, gases, or particulates of materials that are harmful to skin or capable of being absorbed through the intact skin;

(ii) Substances with a high degree of hazard to the skin are known or suspected to be present, and skin contact is possible; or

(iii) Operations are being conducted in confined, poorly ventilated areas, and the absence of conditions requiring Level A have not yet been determined.

(b) Level B protection should be used when:

(i) The type and atmospheric concentration of substances have been identified and require a high level of respiratory protection, but less skin protection;

(ii) The atmosphere contains less than 19.5 percent oxygen; or

(iii) The presence of incompletely identified vapors or gases is indicated by a direct-reading organic vapor detection instrument, but vapors and gases are not suspected of containing high levels of chemicals harmful to skin or capable of being absorbed through the skin.

Note: This involves atmospheres with IDLH concentrations of specific substances that present severe inhalation hazards and that do not represent a severe skin hazard; or that do not meet the criteria for use of air-purifying respirators.

(c) Level C protection should be used when:

(i) The atmospheric contaminants, liquid splashes, or other direct contact will not adversely affect or be absorbed through any exposed skin;

(ii) The types of air contaminants have been identified, concentrations measured, and an air-purifying respirator is available that can remove the contaminants; and

(iii) All criteria for the use of air-purifying respirators are met.

(d) Level D protection should be used when:

(i) The atmosphere contains no known hazard; and

(ii) Work functions preclude splashes, immersion, or the potential for unexpected inhalation of or contact with hazardous levels of any chemicals.

Note: As stated before combinations of personal protective equipment other than those described for Levels A, B, C, and D protection may be more appropriate and may be used to provide the proper level of protection.

(9) As an aid in selecting suitable chemical protective clothing, it should be noted that the National Fire Protection Association is developing standards on chemical protective clothing. These standards are currently undergoing public review prior to adoption, including:

(a) NFPA 1991 - Standard on Vapor-Protective Suits for Hazardous Chemical Emergencies (EPA Level A Protective Clothing);

(b) NFPA 1991 - Standard on Liquid Splash-Protective Suits for Hazardous Chemical Emergencies (EPA Level B Protective Clothing);

(c) NFPA 1993 - Standard on Liquid Splash-Protective Suits for Nonemergency, Nonflammable Hazardous Chemical Situations (EPA Level B Protective Clothing).

(10) These standards would apply documentation and performance requirements to the manufacture of chemical protective suits. Chemical protective suits meeting these requirements would be labelled as compliant with the appropriate standard. When these standards are adopted by the National Fire Protection Association, it is recommended that chemical protective suits which meet these standards be used.

[Statutory Authority: Chapter 49.17 RCW. 89-21-018, § 296-62-3170, filed 10/10/89, effective 11/24/89; 88-21-002 (Order 88-23), § 296-62-3170, filed 10/6/88, effective 11/7/88.]

**WAC 296-62-3180 Appendix C--Compliance guidelines.** (1) Occupational safety and health program. Each hazardous waste site clean-up effort will require an occupational safety and health program headed by the site coordinator or the employer's representative. The purpose of the program will be the protection of employees at the site and will be an extension of the employer's overall safety and health program. The program will need to be developed before work begins on the site and implemented as work proceeds as stated in WAC 296-62-3010. The program is to facilitate coordination and communication of safety and health issues among personnel responsible for the various activities which will take place at the site. It will provide the overall means for planning and implementing the needed

safety and health training and job orientation of employees who will be working at the site. The program will provide the means for identifying and controlling worksite hazards and the means for monitoring program effectiveness. The program will need to cover the responsibilities and authority of the site coordinator or the employer's manager on the site for the safety and health of employees at the site, and the relationships with contractors or support services as to what each employer's safety and health responsibilities are for their employees on the site. Each contractor on the site needs to have its own safety and health program so structured that it will smoothly interface with the program of the site coordinator or principal contractor. Also those employers involved with treating, storing, or disposal of hazardous waste as covered in WAC 296-62-3140 must have implemented a safety and health plan for their employees. This program is to include the hazard communication program required in WAC 296-62-3140(1) and the training required in WAC 296-62-3140 (4) and (5) as parts of the employers comprehensive overall safety and health program. This program is to be in writing.

(a) Each site or workplace safety and health program will need to include the following:

(i) Policy statements of the line of authority and accountability for implementing the program, the objectives of the program and the role of the site safety and health officer or manager and staff;

(ii) Means or methods for the development of procedures for identifying and controlling workplace hazards at the site;

(iii) Means or methods for the development and communication to employees of the various plans, work rules, standard operating procedures and practices that pertain to individual employees and supervisors;

(iv) Means for the training of supervisors and employees to develop the needed skills and knowledge to perform their work in a safe and healthful manner;

(v) Means to anticipate and prepare for emergency situations; and

(vi) Means for obtaining information feedback to aid in evaluating the program and for improving the effectiveness of the program. The management and employees should be trying continually to improve the effectiveness of the program thereby enhancing the protection being afforded those working on the site.

(b) Accidents on the site should be investigated to provide information on how such occurrences can be avoided in the future. When injuries or illnesses occur on the site or workplace, they will need to be investigated to determine what needs to be done to prevent this incident from occurring again. Such information will need to be used as feedback on the effectiveness of the program and the information turned into positive steps to prevent any reoccurrence. Receipt of employee suggestions or complaints relating to safety and health issues involved with site or workplace activities is also a feedback mechanism that can be used effectively to improve the program and may serve in part as an evaluative tool(s).

(c) For the development and implementation of the program to be the most effective, professional safety and

health personnel should be used. Certified safety professionals, board-certified industrial hygienists, or registered professional safety engineers are good examples of professional stature for safety and health managers who will administer the employer's program.

(2) The training programs for employees subject to the requirements of WAC 296-62-3040 are expected to address: The safety and health hazards employees should expect to find on sites; what control measures or techniques are effective for those hazards; what monitoring procedures are effective in characterizing exposure levels; what makes an effective employer's safety and health program; what a site safety and health plan should include; hands-on training with personal protective equipment and clothing they may be expected to use; the contents of the WISHA standard relevant to the employee's duties and functions; and, employee's responsibilities under WISHA and other regulations. Supervisors will need training in their responsibilities under the safety and health program and its subject areas such as the spill containment program, the personal protective equipment program, the medical surveillance program, the emergency response plan and other areas.

(a) The training programs for employees subject to the requirements of WAC 296-62-3140 should address: The employers safety and health program elements impacting employees; the hazard communication program; the medical surveillance program; the hazards and the controls for such hazards that employees need to know for their job duties and functions. All require annual refresher training.

(b) The training programs for employees covered by the requirements of WAC 296-62-3110(3) will address those competencies required for the various levels of response such as: The hazards associated with hazardous substances; hazard identification and awareness; notification of appropriate persons; the need for and use of personal protective equipment including respirators; the decontamination procedures to be used; preplanning activities for hazardous substance incidents including the emergency response plan; company standard operating procedures for hazardous substance emergency responses; the use of the incident command system and other subjects. Hands-on training should be stressed whenever possible. Critiques done after an incident which include any evaluation of what worked, and what did not, and how can we do better the next time, may be counted as training time.

(c) For hazardous materials specialists (usually members of hazardous materials teams), the training will need to address the care, use and/or testing of chemical protective clothing including totally encapsulating suits, the medical surveillance program, the standard operating procedures for the hazardous materials team including the use of plugging and patching equipment and other subject areas.

(d) Officers and leaders who may be expected to be in charge at an incident will need to be fully knowledgeable of their company's incident command system. They will

need to know where and how to obtain additional assistance and be familiar with the local district's emergency response plan and the state emergency response plan.

(e) Specialist employees such as technical experts, medical experts, or environmental experts that work with hazardous materials in their regular jobs, who may be sent to the incident scene by the shipper, manufacturer or governmental agency to advise and assist the person in charge of the incident will have training on an annual basis. Their training must include the care and use of personal protective equipment including respirators; knowledge of the incident command system and how they are to relate to it; and those areas needed to keep them current in their respective field as it relates to safety and health involving specific hazardous substances.

(f) Those skilled support personnel, such as employees who work for public works departments or equipment operators who operate bulldozers, sand trucks, backhoes, etc., who may be called to the incident scene to provide emergency support assistance, will need to have at least a safety and health briefing before entering the area of potential or actual exposure. These specially skilled support personnel, who have not been a part of the emergency plan and do not meet the training requirements, must be made aware of the hazards they face and be provided all necessary protective clothing and equipment required for their tasks.

(3) Decontamination. Decontamination procedures will be tailored to the specific hazards of the site and will vary in complexity, and number of steps, depending on the level of hazard and the employee's exposure to the hazard. Decontamination procedures and PPE decontamination methods will vary depending upon the specific substance, since one procedure or method will not work for all substances. Evaluation of decontamination methods and procedures should be performed, as necessary, to assure that employees are not exposed to hazards by reusing PPE. References in WAC 296-62-3190, Appendix D, may be used for guidance in establishing an effective decontamination program. In addition, the United States Coast Guard Manual, "Policy Guidance for Response to Hazardous Chemical Releases," United States Department of Transportation, Washington, D.C. (COMDTINST M16465.30), is a good reference for establishing an effective decontamination program.

(4) Emergency response plans. States, along with designated districts within the states, will be developing or have developed emergency response plans. These state and district plans are to be utilized in the emergency response plans called for in this standard. Each employer needs to assure that its emergency response plan is compatible with the local plan. The major reference being used to aid in developing the state and local district plans is the Hazardous Materials Emergency Planning Guide, NRT-1. The current Emergency Response Guidebook from the United States Department of Transportation, CMA's CHEMTREC and the Fire Service Emergency Management Handbook may also be used as resources.

Employers involved with treatment, storage, and disposal facilities for hazardous waste, which have the required contingency plan called for by their permit, would not need to duplicate the same planning elements. Those items of the emergency response plan that are properly addressed in the contingency plan may be substituted into the emergency response plan required in WAC 296-62-3112 or otherwise kept together for employer and employee use.

(5) Personal protective equipment programs. The purpose of personal protective clothing and equipment (PPE) is to shield or isolate individuals from the chemical, physical, and biologic hazards that may be encountered at a hazardous substance site.

(a) As discussed in Appendix B, no single combination of protective equipment and clothing is capable of protecting against all hazards. Thus PPE should be used in conjunction with other protective methods and its effectiveness evaluated periodically.

(b) The use of PPE can itself create significant worker hazards, such as heat stress, physical and psychological stress, and impaired vision, mobility, and communication. For any given situation, equipment and clothing will be selected that provide an adequate level of protection. However, over-protection, as well as under-protection, can be hazardous and should be avoided where possible.

(c) Two basic objectives of any PPE program will be to protect the wearer from safety and health hazards, and to prevent injury to the wearer from incorrect use and/or malfunction of the PPE. To accomplish these goals, a comprehensive PPE program will include hazard identification, medical monitoring, environmental surveillance, selection, use, maintenance, and decontamination of PPE and its associated training.

(d) The written PPE program will include policy statements, procedures, and guidelines. Copies will be made available to all employees and a reference copy will be made available at the worksite. Technical data on equipment, maintenance manuals, relevant regulations, and other essential information will also be collected and maintained.

(6) Incident command system (ICS). WAC 296-62-3112 (3)(b) requires the implementation of an ICS. The ICS is an organized approach to effectively control and manage operations at an emergency incident. The individual in charge of the ICS is the senior official responding to the incident. The ICS is not much different than the "command post" approach used for many years by the fire service. During large complex fires involving several companies and many pieces of apparatus, a command post would be established. This enables one individual to be in charge of managing the incident, rather than having several officers from different companies making separate, and sometimes conflicting, decisions. The individual in charge of the command post would delegate responsibility for performing various tasks to subordinate officers. Additionally, all communications were routed through the command post to reduce the number of radio transmissions and eliminate confusion.



However, strategy, tactics, and all decisions were made by one individual.

(a) The ICS is a very similar system, except it is implemented for emergency response to all incidents, both large and small, that involve hazardous substances.

(b) For a small incident, the individual in charge of the ICS may perform many tasks of the ICS. There may not be any, or little, delegation of tasks to subordinates. For example, in response to a small incident, the individual in charge of the ICS, in addition to normal command activities, may become the safety officer and may designate only one employee (with proper equipment) as a back-up to provide assistance if needed. WISHA does recommend, however, that at least two employees be designated as back-up personnel since the assistance needed may include rescue.

(c) To illustrate the operation of the ICS, the following scenario might develop during a small incident, such as an overturned tank truck with a small leak of flammable liquid.

(d) The first responding senior officer would implement and take command of the ICS. That person would size-up the incident and determine if additional personnel and apparatus were necessary; would determine what actions to take to control the leak; and, determine the proper level of personal protective equipment. If additional assistance is not needed, the individual in charge of the ICS would implement actions to stop and control the leak using the fewest number of personnel that can effectively accomplish the tasks. The individual in charge of the ICS then would designate him or herself as the safety officer and two other employees as a back-up in case rescue may become necessary. In this scenario, decontamination procedures would not be necessary.

(e) A large complex incident may require many employees and difficult, time-consuming efforts to control. In these situations, the individual in charge of the ICS will want to delegate different tasks to subordinates in order to maintain a span of control that will keep the number of subordinates, that are reporting, to a manageable level.

(f) Delegation of tasks at large incidents may be by location, where the incident scene is divided into sectors, and subordinate officers coordinate activities within the sector that they have been assigned.

(g) Delegation of tasks can also be by function. Some of the functions that the individual in charge of the ICS may want to delegate at a large incident are: Medical services; evacuation; water supply; resources (equipment, apparatus); media relations; safety; and, site control (integrate activities with police for crowd and traffic control). Also for a large incident, the individual in charge of the ICS will designate several employees as back-up personnel; and a number of safety officers to monitor conditions and recommend safety precautions.

(h) Therefore, no matter what size or complexity an incident may be, by implementing an ICS there will be one individual in charge who makes the decisions and gives directions; and, all actions and communications are coordinated through one central point of command.

Such a system should reduce confusion, improve safety, organize and coordinate actions, and should facilitate effective management of the incident.

(7) Site safety and control plans.

(a) The safety and security of response personnel and others in the area of an emergency response incident site should be of primary concern to the incident commander. The use of a site safety and control plan could greatly assist those in charge of assuring the safety and health of employees on the site.

(b) A comprehensive site safety and control plan should include the following: Summary analysis of hazards on the site and a risk analysis of those hazards; site map or sketch; site work zones (clean zone, transition or decontamination zone, work or hot zone); use of the buddy system; site communications; command post or command center; standard operating procedures and safe work practices; medical assistance and triage area; hazard monitoring plan (air contaminant monitoring, etc.); decontamination procedures and area; and other relevant areas. This plan should be a part of the employer's emergency response plan or an extension of it to the specific site.

(8) Medical surveillance programs.

(a) Workers handling hazardous substances may be exposed to toxic chemicals, safety hazards, biologic hazards, and radiation. Therefore, a medical surveillance program is essential to assess and monitor workers' health and fitness for employment in hazardous waste operations and during the course of work; to provide emergency and other treatment as needed; and to keep accurate records for future reference.

(b) *The Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities* developed by the National Institute for Occupational Safety and Health (NIOSH), the Occupational Safety and Health Administration (OSHA), the United States Coast Guard (USCG), and the Environmental Protection Agency (EPA); October 1985 provides an excellent example of the types of medical testing that should be done as part of a medical surveillance program.

[Statutory Authority: Chapter 49.17 RCW. 89-21-018 (Order 89-10), § 296-62-3180, filed 10/10/89, effective 11/24/89; 88-21-002 (Order 88-23), § 296-62-3180, filed 10/6/88, effective 11/7/88.]

**WAC 296-62-3190 Appendix D--References.** The following references may be consulted for further information on the subject of this notice:

(1) *OSHA Instruction DFO CPL 2.70 - January 29, 1986, Special Emphasis Program: Hazardous Waste Sites.*

(2) *OSHA Instruction DFO CPL 2-2.37A - January 29, 1986, Technical Assistance and Guidelines for Superfund and Other Hazardous Waste Site Activities.*

(3) *OSHA Instruction DTS CPL 2.74 - January 29, 1986, Hazardous Waste Activity Form, OSHA 175.*

(4) *Hazardous Waste Inspections Reference Manual, U.S. Department of Labor, Occupational Safety and Health Administration, 1986.*

(5) *Memorandum of Understanding Among the National Institute for Occupational Safety and Health, the*



Occupational Safety and Health Administration, the United States Coast Guard, and the United States Environmental Protection Agency; *Guidance for Worker Protection During Hazardous Waste Site Investigations and Clean-up and Hazardous Substance Emergencies*; December 18, 1980.

(6) *National Priorities List*, 1st Edition, October 1984; U.S. Environmental Protection Agency, Revised periodically.

(7) *The Decontamination of Response Personnel, Field Standard Operating Procedures (F.S.O.P.) 7*; U.S. Environmental Protection Agency, Office of Emergency and Remedial Response, Hazardous Response Support Division, December 1984.

(8) *Preparation of a Site Safety Plan, Field Standard Operating Procedures (F.S.O.P.) 9*; U.S. Environmental Protection Agency, Office of Emergency and Remedial Response, Hazardous Response Support Division, April 1985.

(9) *Standard Operating Safety Guidelines*; U.S. Environmental Protection Agency, Office of Emergency and Remedial Response, Hazardous Response Support Division, Environmental Response Team; November 1984.

(10) *Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities*, National Institute for Occupational Safety and Health (NIOSH), Occupational Safety and Health Administration (OSHA), U.S. Coast Guard (USCG), and Environmental Protection Agency (EPA); October 1985.

(11) *Protecting Health and Safety at Hazardous Waste Sites: An Overview*, U.S. Environmental Protection Agency, EPA/625/9-85/006; September 1985.

(12) *Hazardous Waste Sites and Hazardous Substance Emergencies*, NIOSH Worker Bulletin, U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control, National Institute for Occupational Safety and Health; December 1982.

(13) *Personal Protective Equipment for Hazardous Materials Incidents: A Selection Guide*; U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control, National Institute for Occupational Safety and Health; October 1984.

(14) *Fire Service Emergency Management Handbook*, International Association of Fire Chiefs Foundation, 101 East Holly Avenue, Unit 10B, Sterling, VA 22170, January 1985.

(15) *Emergency Response Guidebook*, U.S. Department of Transportation, Washington, D.C., 1987.

(16) *Report to the Congress on Hazardous Materials Training, Planning and Preparedness*, Federal Emergency Management Agency, Washington, D.C., July 1986.

(17) *Workbook for Fire Command*, Alan V. Brunacini and J. David Beageron, National Fire Protection Association, Batterymarch Park, Quincy, MA 02269, 1985.

(18) *Fire Command*, Alan V. Brunacini, National Fire Protection, Batterymarch Park, Quincy, MA 02269, 1985.

(19) *Incident Command System, Fire Protection Publications*, Oklahoma State University, Stillwater, OK 74078, 1983.

(20) *Site Emergency Response Planning*, Chemical Manufacturers Association, Washington, D.C. 20037, 1986.

(21) *Hazardous Materials Emergency Planning Guide, NRT-1*, Environmental Protection Agency, Washington, D.C., March 1987.

(22) *Community Teamwork: Working Together to Promote Hazardous Materials Transportation Safety*, U.S. Department of Transportation, Washington, D.C., May 1983.

(23) *Disaster Planning Guide for Business and Industry*, Federal Emergency Management Agency, Publication No. FEMA 141, August 1987.

[Statutory Authority: Chapter 49.17 RCW. 89-21-018 (Order 89-10), § 296-62-3190, filed 10/10/89, effective 11/24/89; 88-21-002 (Order 88-23), § 296-62-3190, filed 10/6/88, effective 11/7/88.]

### Chapter 296-63 WAC

#### RIGHT TO KNOW FEE ASSESSMENT

##### WAC

296-63-001	Purpose and scope.
296-63-003	Definitions.
296-63-005	Selected industries.
296-63-007	Fee assessment.
296-63-009	Exemption requests.
296-63-011	Fraudulent exemption requests.
296-63-013	Appeals.
296-63-015	Fee assessment not received.

**WAC 296-63-001 Purpose and scope.** This chapter establishes a fee assessment under the Worker and Community Right to Know Act in accordance with RCW 49.70.170.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 86-23-003 (Order 86-38), § 296-63-001, filed 11/6/86.]

**WAC 296-63-003 Definitions.** Unless the context clearly requires otherwise, the definitions of this section shall apply throughout this chapter.

(1) "Department" means the department of labor and industries.

(2) "Director" means the director of the department of labor and industries or his/her designee.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 86-23-003 (Order 86-38), § 296-63-003, filed 11/6/86.]

**WAC 296-63-005 Selected industries.** Fees shall only be assessed to employers engaged in business operations having a standard industrial classification, as designated in the standard industrial classification manual prepared by the federal Office of Management and Budget, within the following major groups:

(1) Numbers 01 through 08 (agriculture and forestry industries).

(2) Numbers 10 through 14 (mining industries).

(3) Numbers 15 through 17 (construction industries).

Occupational Safety and Health Administration, the United States Coast Guard, and the United States Environmental Protection Agency; *Guidance for Worker Protection During Hazardous Waste Site Investigations and Clean-up and Hazardous Substance Emergencies*; December 18, 1980.

(6) *National Priorities List*, 1st Edition, October 1984; U.S. Environmental Protection Agency, Revised periodically.

(7) *The Decontamination of Response Personnel, Field Standard Operating Procedures (F.S.O.P.) 7*; U.S. Environmental Protection Agency, Office of Emergency and Remedial Response, Hazardous Response Support Division, December 1984.

(8) *Preparation of a Site Safety Plan, Field Standard Operating Procedures (F.S.O.P.) 9*; U.S. Environmental Protection Agency, Office of Emergency and Remedial Response, Hazardous Response Support Division, April 1985.

(9) *Standard Operating Safety Guidelines*; U.S. Environmental Protection Agency, Office of Emergency and Remedial Response, Hazardous Response Support Division, Environmental Response Team; November 1984.

(10) *Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities*, National Institute for Occupational Safety and Health (NIOSH), Occupational Safety and Health Administration (OSHA), U.S. Coast Guard (USCG), and Environmental Protection Agency (EPA); October 1985.

(11) *Protecting Health and Safety at Hazardous Waste Sites: An Overview*, U.S. Environmental Protection Agency, EPA/625/9-85/006; September 1985.

(12) *Hazardous Waste Sites and Hazardous Substance Emergencies*, NIOSH Worker Bulletin, U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control, National Institute for Occupational Safety and Health; December 1982.

(13) *Personal Protective Equipment for Hazardous Materials Incidents: A Selection Guide*; U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control, National Institute for Occupational Safety and Health; October 1984.

(14) *Fire Service Emergency Management Handbook*, International Association of Fire Chiefs Foundation, 101 East Holly Avenue, Unit 10B, Sterling, VA 22170, January 1985.

(15) *Emergency Response Guidebook*, U.S. Department of Transportation, Washington, D.C., 1987.

(16) *Report to the Congress on Hazardous Materials Training, Planning and Preparedness*, Federal Emergency Management Agency, Washington, D.C., July 1986.

(17) *Workbook for Fire Command*, Alan V. Brunacini and J. David Beageron, National Fire Protection Association, Batterymarch Park, Quincy, MA 02269, 1985.

(18) *Fire Command*, Alan V. Brunacini, National Fire Protection, Batterymarch Park, Quincy, MA 02269, 1985.

(19) *Incident Command System, Fire Protection Publications*, Oklahoma State University, Stillwater, OK 74078, 1983.

(20) *Site Emergency Response Planning*, Chemical Manufacturers Association, Washington, D.C. 20037, 1986.

(21) *Hazardous Materials Emergency Planning Guide, NRT-1*, Environmental Protection Agency, Washington, D.C., March 1987.

(22) *Community Teamwork: Working Together to Promote Hazardous Materials Transportation Safety*, U.S. Department of Transportation, Washington, D.C., May 1983.

(23) *Disaster Planning Guide for Business and Industry*, Federal Emergency Management Agency, Publication No. FEMA 141, August 1987.

[Statutory Authority: Chapter 49.17 RCW. 89-21-018 (Order 89-10), § 296-62-3190, filed 10/10/89, effective 11/24/89; 88-21-002 (Order 88-23), § 296-62-3190, filed 10/6/88, effective 11/7/88.]

### Chapter 296-63 WAC

#### RIGHT TO KNOW FEE ASSESSMENT

##### WAC

296-63-001	Purpose and scope.
296-63-003	Definitions.
296-63-005	Selected industries.
296-63-007	Fee assessment.
296-63-009	Exemption requests.
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296-63-013	Appeals.
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**WAC 296-63-001 Purpose and scope.** This chapter establishes a fee assessment under the Worker and Community Right to Know Act in accordance with RCW 49.70.170.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 86-23-003 (Order 86-38), § 296-63-001, filed 11/6/86.]

**WAC 296-63-003 Definitions.** Unless the context clearly requires otherwise, the definitions of this section shall apply throughout this chapter.

(1) "Department" means the department of labor and industries.

(2) "Director" means the director of the department of labor and industries or his/her designee.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 86-23-003 (Order 86-38), § 296-63-003, filed 11/6/86.]

**WAC 296-63-005 Selected industries.** Fees shall only be assessed to employers engaged in business operations having a standard industrial classification, as designated in the standard industrial classification manual prepared by the federal Office of Management and Budget, within the following major groups:

(1) Numbers 01 through 08 (agriculture and forestry industries).

(2) Numbers 10 through 14 (mining industries).

(3) Numbers 15 through 17 (construction industries).

(4) Numbers 20 through 39 (manufacturing industries).

(5) Numbers 41, 42, and 44 through 49 (transportation, communications, electric, gas, and sanitary services).

(6) Number 75 (automotive repair services, and garages).

(7) Number 76 (miscellaneous repair services).

(8) Number 80 (health services).

(9) Number 82 (educational services).

[Statutory Authority: RCW 49.17.040 and 49.17.050. 86-23-003 (Order 86-38), § 296-63-005, filed 11/6/86.]

**WAC 296-63-007 Fee assessment.** (1) The department shall assess an annual fee to each employer in the selected industries identified in WAC 296-63-003.

(2) The fee shall only be assessed to employers who reported ten thousand four hundred or more worker hours to the department.

(3) The fee assessment shall be based on reported worker hours for the prior calendar year.

(4) One full-time equivalent employee is equal to two thousand eighty worker hours.

(5) The fee assessment shall be two dollars and fifty cents for each full-time equivalent employee. Any fraction of a full-time equivalent employee shall be counted as one full-time equivalent employee.

(6) The annual fee shall not exceed fifty thousand dollars for an individual employer.

(7) All fees collected by the department shall be deposited in the worker and community right to know fund.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 86-23-003 (Order 86-38), § 296-63-007, filed 11/6/86.]

**WAC 296-63-009 Exemption requests.** (1) Employers who do not have hazardous chemicals at their workplace may submit a written request for exemption to the department. Submission of an exemption request does not relieve an employer of his/her obligation to pay the fee assessment until such time as the request is approved. Employers granted exemptions will be removed from the listing of employers to be assessed a fee beginning with the first billing following the date the exemption request is approved.

(2) Retroactive exemption requests shall not be granted.

(3) Exemptions shall only be considered for an employer's entire workplace consisting of all activities reported to the department under the same employer identification number.

(4) Each request for exemption must contain the following information:

(a) Firm name and employer identification number;

(b) Complete mailing address;

(c) Complete location (such as street) address;

(d) A certified statement in the form required by RCW 9A.72.085 that a hazardous chemical survey of the employer's premises has been completed by a qualified person, the identity and qualifications of the person completing the survey, and that no hazardous chemicals

as defined by WAC 296-62-054 through 296-62-05427 are present at the workplace.

(5) The department may schedule an on-site inspection to determine the validity of the exemption request.

(6) The employer shall provide to the department within five working days of receiving a request from the department, any additional information identified by the department as necessary for evaluating the exemption request.

(7) Exemption requests shall be mailed to:

Right to Know Program

Department of Labor and Industries, HC-489

805 Plum Street S.E.

Olympia, Washington 98504

[Statutory Authority: RCW 49.17.040 and 49.17.050. 86-23-003 (Order 86-38), § 296-63-009, filed 11/6/86.]

**WAC 296-63-011 Fraudulent exemption requests.**

(1) The department may assess a civil penalty against any employer who submits a fraudulent exemption request. Such penalty assessment shall be consistent with RCW 49.17.180(1), and shall not exceed fifty-thousand dollars.

(2) In addition, the director may cause a record of such fraudulent exemptions submission to be referred to the prosecuting attorney of the county wherein such submission occurred.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 86-23-003 (Order 86-38), § 296-63-011, filed 11/6/86.]

**WAC 296-63-013 Appeals.** An employer may appeal the fee assessment or penalties in accordance with RCW 49.70.170(4).

[Statutory Authority: RCW 49.17.040 and 49.17.050. 86-23-003 (Order 86-38), § 296-63-013, filed 11/6/86.]

**WAC 296-63-015 Fee assessment not received.** When fee assessments are not received by the department, penalties shall be assessed to the delinquent employer in accordance with chapter 49.70 RCW and RCW 49.70.177.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 86-23-003 (Order 86-38), § 296-63-015, filed 11/6/86.]

## Chapter 296-65 WAC

### ASBESTOS REMOVAL AND ENCAPSULATION

#### WAC

296-65-001	Purpose and scope.
296-65-003	Definitions.
296-65-005	Asbestos worker training course content.
296-65-007	Asbestos supervisor training course content.
296-65-010	Asbestos worker certification.
296-65-012	Asbestos supervisor certification.
296-65-015	Training course approval.
296-65-017	Contractor certification.
296-65-020	Notification requirements.
296-65-025	Fees.
296-65-030	Methods of compliance.
296-65-035	Reciprocity.
296-65-050	Denial, suspension, and revocation of certificates.

## DISPOSITION OF SECTIONS FORMERLY CODIFIED IN THIS CHAPTER

- 296-65-040 Appeals—Notice and filing. [Statutory Authority: RCW 49.17.050(2) and 49.17.040. 87-10-008 (Order 87-06), § 296-65-040, filed 4/27/87. Statutory Authority: SSB 4209, 1985 c 387. 85-21-080 (Order 85-30), § 296-65-040, filed 10/22/85.] Repealed by 87-24-051 (Order 87-24), filed 11/30/87. Statutory Authority: Chapter 49.17 RCW.
- 296-65-045 Appeals—Procedure. [Statutory Authority: SSB 4209, 1985 c 387. 85-21-080 (Order 85-30), § 296-65-045, filed 10/22/85.] Repealed by 87-24-051 (Order 87-24), filed 11/30/87. Statutory Authority: Chapter 49.17 RCW.

**WAC 296-65-001 Purpose and scope.** This standard regulates asbestos removal and encapsulation, requires contractor certification, specifies minimum training for supervisors and workers on asbestos projects, requires notification of asbestos projects, and establishes a training course approval program. This standard applies to the removal or encapsulation of any asbestos containing material with the exception of those materials containing less than one percent asbestos by volume.

[Statutory Authority: Chapter 49.17 RCW. 89-21-018 (Order 89-10), § 296-65-001, filed 10/10/89, effective 11/24/89. Statutory Authority: SSB 4209, 1985 c 387. 85-21-080 (Order 85-30), § 296-65-001, filed 10/22/85.]

**WAC 296-65-003 Definitions.** Unless the context clearly requires otherwise, the definitions in this section apply throughout this standard.

- (1) "Approved" means approved by the department.
- (2) "Asbestos" includes different forms of chrysotile, amosite, crocidolite, tremolite, anthophyllite and actinolite.
- (3) "Asbestos fiber" means asbestos fiber as defined in WAC 296-62-07703.
- (4) "Asbestos abatement project" means any asbestos project which is conducted primarily to remove or encapsulate asbestos-containing material (ACM). Removal of ACM which is ancillary to a maintenance task is not considered an abatement project as long as the amount of ACM removed is less than 48 square feet or 10 linear feet.
- (5) "Asbestos project" includes the construction, demolition, repair, remodeling, maintenance or renovation of any public or private building or structure, mechanical piping equipment or system involving the demolition, removal, encapsulation, salvage, or disposal of material or outdoor activity releasing or likely to release asbestos fibers into the air. Removal of vinyl asbestos tile (VAT), and asphaltic roofing materials is excluded from this definition, unless these items are removed by mechanical methods such as chipping, grinding, sanding, or sawing. Also excluded is any project in which there is a disturbance of asbestos of less than one square foot of total surface area of asbestos-containing material (ACM), but this latter exclusion does not pertain to any disturbance of asbestos during a project dealing with pipe insulation. Also excluded from this definition is work on asbestos-cement water pipe provided such work is done

in accordance with the latest edition of "Recommended Standard Asbestos-Cement Pipe Work Practice Procedures and Training Requirements" adopted and published by the Pacific Northwest Section of the American Water Works Association and as approved by the department.

(6) "Certified asbestos contractor" means any partnership, firm, association, corporation or sole proprietorship, registered under chapter 18.27 RCW, that submits a bid, or contracts to remove or encapsulate asbestos for another and is certified by the department to remove or encapsulate asbestos.

(7) "Certificate" means a certificate issued by the department.

(8) "Certified asbestos supervisor" means an individual who is certified by the department under WAC 296-65-012.

(9) "Certified asbestos worker" means an individual certified by the department under WAC 296-65-010.

(10) "Department" means the department of labor and industries.

(11) "Demolition" means the activity of razing a structure which includes the wrecking, removal, or dismantling of any load-supporting structural member of any facility including any related handling operations.

(12) "Direct on-site supervision" means the supervision of no more than three workers by a certified asbestos supervisor who is physically present at all times at the asbestos project. It includes the authority to immediately correct any deficiencies on the project.

(13) "Director" means the director of the department of labor and industries or the director's designee.

(14) "Emergency project" means a project that was not planned but results from a sudden, unexpected event and includes operations which are necessitated by non-routine failures of equipment or systems.

(15) "Encapsulation" means the application of an encapsulant to asbestos containing materials to control the release of asbestos fibers into the air. The encapsulation process either creates a membrane over the surface (bridging encapsulant) or penetrates the material and binds its components together (penetrating encapsulant).

(16) "HEPA filtration" means high-efficiency particulate air filtration found in respirators and vacuum systems capable of filtering 0.3 micron particles with 99.97% efficiency.

(17) "NESHAP" means the National Emission Standards for Hazardous Air Pollutants.

(18) "Owner" means the person who owns any public or private building, structure, facility, or mechanical system, or the remnants thereof, or the agent of such person, but does not include individuals who work on asbestos projects in their own single-family residences, no part of which is used for commercial purposes.

(19) "Person" means any individual, partnership, firm, association, corporation, sole proprietorship, or the state of Washington or its political subdivisions.

(20) "Revocation" means a permanent withdrawal of a certification issued by the department.

(21) "Suspension" means a temporary withdrawal of a certification issued by the department. No suspension shall be less than six months or longer than one year.

[Statutory Authority: Chapter 49.17 RCW. 89-21-018 (Order 89-10), § 296-65-003, filed 10/10/89, effective 11/24/89; 87-24-051 (Order 87-24), § 296-65-003, filed 11/30/87. Statutory Authority: SSB 4209, 1985 c 387. 85-21-080 (Order 85-30), § 296-65-003, filed 10/22/85.]

**WAC 296-65-005 Asbestos worker training course content.** An approved asbestos worker training course shall consist of at least thirty hours of training. This initial training course shall provide, at a minimum, information on the following topics:

(1) The physical characteristics of asbestos including types, fiber size, aerodynamic characteristics and physical appearance.

(2) Examples of different types of asbestos and asbestos-containing materials. Real asbestos shall be used only for observation by trainees and shall be enclosed in sealed unbreakable containers.

(3) The health hazards of asbestos including the nature of asbestos related diseases, routes of exposure, dose-response relationships, synergism between cigarette smoking and asbestos exposure, latency period of diseases, hazards to immediate family, and the health basis for asbestos standards.

(4) Employee personal protective equipment including the classes and characteristics of respirator types, limitations of respirators, proper selection, inspection, donning, use, maintenance and storage procedure, methods for field checking of the facepiece-to-face seal (positive and negative-pressure checks), qualitative and quantitative fit testing procedures, variability between field and laboratory protection factors, factors that alter respirator fit (e.g., eye glasses and facial hair), the components of a proper respiratory protection program, respirator program administrator, requirements on oil lubricated reciprocating piston compressors for breathing air, and selection and use of personal protective clothing. Qualitative or quantitative fit testing shall be performed on at least one student for demonstration purposes and in accordance with WAC 296-62-07715 and 296-62-07739.

(5) Use, storage and handling of launderable clothing, nonslip footwear, gloves, eye protection and hard hats.

(6) Medical monitoring procedures and requirements, including the provisions of WAC 296-62-071 through 296-62-07121 and 296-62-07725, any additional recommended procedures and tests, benefits of medical monitoring and employee access to records.

(7) Air monitoring procedures and requirements specified in WAC 296-62-07709, including a description of equipment, sampling methods and strategies, reasons for air monitoring, types of samples, including area, personal and clearance samples, current standards with proposed changes if any, employee observation and notification, recordkeeping and employee access to records, interpretation of air monitoring results, and analytical methods for bulk and air samples.

(8) State-of-the-art work practices for asbestos removal and encapsulation activities including purpose,

proper construction and maintenance of barriers and decontamination enclosure systems, posting of warning signs, electrical and ventilation system lock-out, proper working techniques and tools with vacuum attachments for minimizing fiber release, use of wet methods and surfactants, use of negative-pressure ventilation equipment for minimizing employee exposure to asbestos fibers and contamination prevention, scoring and breaking techniques for rigid asbestos products, glove bag techniques, use of HEPA vacuums and proper clean-up and disposal procedures. Work practice requirements for removal, encapsulation, enclosure, repair, and waste transportation shall be discussed individually. Appropriate work practices for both indoor and outdoor asbestos projects shall be included.

(9) Personal hygiene including entry and exit procedures for the work area, use of showers and prohibition of eating, drinking, smoking and chewing (gum or tobacco) in the work area.

(10) Additional safety hazards that may be encountered during asbestos removal and encapsulation activities and hazard abatement, including electrical hazards, scaffold and ladder hazards, slips, trips and falls, confined spaces, noise, and heat stress.

(11) The requirements, procedures and standards established by:

(a) The Environmental Protection Agency, 40 CFR Part 61, Subparts A and M.

(b) Washington state department of ecology.

(c) Local air pollution control agencies.

(d) Washington state department of labor and industries, division of industrial safety and health, chapter 49.17 RCW (Washington Industrial Safety and Health Act), chapter 49.26 RCW (Health and safety—Asbestos), and ensuing regulations.

(12) Actual worksite considerations.

(13) The instruction required by this section shall include, at a minimum, hands-on training for the following:

(a) Glove bag techniques;

(b) The opportunity to don respirators including half facepiece and full facepiece air purifying respirators, powered air purifying respirators (PAPR), and Type-C supplied-air respirators;

(c) Removal of sprayed-on or troweled-on material, and pipe lagging;

(d) Basic construction of a decontamination unit, and proper entry and exit;

(e) Suit-up in protective clothing consisting of coveralls, foot coverings and head coverings.

(14) Asbestos-containing materials shall not be used for hands-on training.

(15) In recognition that asbestos abatement is an evolving industry, the department reserves the right to require additional subjects to be taught and to specify the amount of time which shall be allotted to adequately cover required subjects. To assure adequate coverage of required material, each sponsor shall be provided and required to incorporate into the training course, a detailed outline of subject matter developed by the department.

[Statutory Authority: Chapter 49.17 RCW. 89-21-018 (Order 89-10), § 296-65-005, filed 10/10/89, effective 11/24/89; 87-24-051 (Order 87-24), § 296-65-005, filed 11/30/87. Statutory Authority: RCW 49.17.050(2) and 49.17.040. 87-10-008 (Order 87-06), § 296-65-005, filed 4/27/87. Statutory Authority: SSB 4209, 1985 c 387. 85-21-080 (Order 85-30), § 296-65-005, filed 10/22/85.]

**WAC 296-65-007 Asbestos supervisor training course content.** An approved asbestos supervisor training course shall consist of at least thirty hours of training. This initial training course shall include lectures, demonstrations, at least six hours of hands-on training, course review and a written examination. Audio-visual materials, where appropriate, are recommended to complement lectures. The training course shall provide, at a minimum, information on the following topics:

(1) The physical characteristics of asbestos and asbestos-containing materials including identification of asbestos, aerodynamic characteristics, typical uses, physical appearance, hazard assessment considerations, and a summary of abatement control options.

(2) Health effects related to asbestos exposure including the nature of asbestos related diseases, routes of exposure, dose-response relationships and the lack of a safe level of exposure, synergism between asbestos exposure and cigarette smoking, latency period, hazards to the immediate family and the health basis for the standard.

(3) Employee personal protective equipment including the classes and characteristics of respirator types, limitations of respirators, proper selection, inspection, donning, use, maintenance, and storage procedures, methods for field checking of the facepiece-to-face seal (positive and negative pressure checks), variability between field and laboratory protection factors, quantitative and qualitative fit test requirements, factors that alter respirator fit (facial hair, scars, etc.), the components of a proper respirator program, requirements for oil lubricated reciprocating compressors, maintenance of Type-C systems, standards for breathing air, selection and use of personal protective clothing, use, storage, and handling of nondisposable clothing, and regulations covering personal protective equipment.

(4) State-of-the-art work practices for asbestos removal and encapsulation activities including purpose, proper construction and maintenance of barriers and decontamination enclosure systems, posting of warning signs, electrical and ventilation system lock-out, proper working techniques and tools with vacuum attachments for minimizing fiber release, use of wet methods and surfactants, use of negative-pressure ventilation equipment for minimizing employee exposure to asbestos fibers and contamination prevention, scoring and breaking techniques for rigid asbestos products, glove bag techniques, use of HEPA vacuums and proper clean-up and disposal procedures. Work practice requirements for removal, encapsulation, and repair shall be discussed separately. Appropriate work practices for both indoor and outdoor asbestos projects shall be included.

(5) Personal hygiene including entry and exit procedures for the work area, use of showers and prohibition

of eating, drinking, smoking, and chewing (gum and tobacco) in the work area. Potential exposures, such as family exposure shall also be included.

(6) Additional safety hazards that may be encountered during asbestos abatement activities and how to deal with them, including electrical hazards, heat stress, air contaminants other than asbestos, fire and explosion hazards, scaffold and ladder hazards, slips, trips, and falls, confined space entry requirements, and noise hazards.

(7) Medical monitoring procedures and requirements, including the provisions of WAC 296-62-071 through 296-62-07121 and 296-62-07725, any additional recommended procedures and tests, benefits of medical monitoring and recordkeeping requirements.

(8) Air monitoring procedures and requirements specified in WAC 296-62-07709, including a description of equipment, sampling methods and strategies, reasons for air monitoring, types of samples, including area, personal and clearance samples, a description of aggressive sampling, current standards with proposed changes if any, employee observation and notification, recordkeeping, interpretation of air monitoring results, specifically from analyses performed by polarized light, phase contrast, and electron microscopy.

(9) The requirements, procedures, and standards established by:

(a) The Environmental Protection Agency, 40 CFR Part 61, Subparts A and M.

(b) The Washington state department of ecology.

(c) Local air pollution control agencies.

(d) Washington state department of labor and industries, division of industrial safety and health, chapter 49.17 RCW (Washington Industrial Safety and Health Act), chapter 49.26 RCW (Health and safety—Asbestos), and ensuing regulations.

(10) Actual worksite considerations.

(11) Insurance and liability issues including contractor issues, industrial insurance coverage and exclusions, third party liabilities and defenses, private insurance coverage and exclusions, recordkeeping recommended for legal and insurance purposes.

(12) Supervisory techniques for asbestos abatement projects including supervisory practices to enforce and reinforce the required work practices and discourage unsafe work practices.

(13) Contract specifications including a discussion of the key elements to be included in contract specifications.

(14) Hands-on training for the following:

(a) Calibration of air-sampling equipment;

(b) Routine maintenance of air-purifying and air-supplied respirators;

(c) Setup of a decontamination unit including calculating the number of negative air machines needed as well as proper placement of the machines within the enclosure; and

(d) Quantitative and qualitative fit-testing protocols.

(15) In recognition that asbestos abatement is an evolving industry, the department reserves the right to require additional subjects to be taught and to specify



the amount of time which shall be allotted to adequately cover required subjects. To assure adequate coverage of required material, each sponsor shall be provided and required to incorporate into their training course, a detailed outline of subject matter developed by the department.

[Statutory Authority: Chapter 49.17 RCW. 89-21-018 (Order 89-10), § 296-65-007, filed 10/10/89, effective 11/24/89.]

**WAC 296-65-010 Asbestos worker certification.** (1) For the purposes of this section "individual" means any natural person.

(2) To qualify for an asbestos worker certificate, an individual must do the following:

(a) Successfully complete an approved asbestos worker training course;

(b) Achieve a score of at least seventy percent on a one hundred question multiple choice examination approved by the department but administered by the training course sponsor;

(c) Submit to the department a timely application validated by an approved training course sponsor. To be considered timely, an application must be received by the department not later than sixty days after the completion of the course. In the event that an application is not timely, the individual shall be required to pass, with a score of at least seventy percent, an examination administered by the department. A nonrefundable fifty dollar assessment shall be charged to take this examination; and

(d) Pay the fee prescribed in WAC 296-65-025.

(3) Individuals shall not perform any asbestos project work prior to issuance of the certificate.

(4) Certificates shall be issued and mailed to the individual applicants and shall be valid for one year from the date of issuance.

(5) Certified asbestos workers shall attend a seven-hour refresher course prior to certificate renewal.

(a) The course shall, at a minimum, adequately review the subjects required by WAC 296-65-005, update information on state-of-the-art procedures and equipment, and review regulatory changes and interpretations. Specific subjects may be required by the department.

(b) An application for renewal of the certificate must be validated by the refresher training course instructor.

(c) The refresher course must be taken prior to expiration of the certificate but may not be taken more than sixty days prior to expiration of the original or current certificate.

(d) The certificate renewal application must be received by the department no later than the expiration date of the current certificate. Applicants missing this renewal deadline shall be required to pass, with a score of seventy percent, an examination administered by the department. A nonrefundable fifty dollar fee will be charged to take this examination.

(e) Individuals whose certificates have been expired for more than six months will be required to retake the entire thirty-hour basic course.

(6) The certificate shall be available for inspection at all times during an asbestos project.

(7) The department may suspend or revoke a certificate as provided in WAC 296-65-050 and chapter 296-350 WAC.

[Statutory Authority: Chapter 49.17 RCW. 89-21-018 (Order 89-10), § 296-65-010, filed 10/10/89, effective 11/24/89. Statutory Authority: SSB 4209, 1985 c 387. 85-21-080 (Order 85-30), § 296-65-010, filed 10/22/85.]

**WAC 296-65-012 Asbestos supervisor certification.**

(1) For the purposes of this section, "individual" means any natural person.

(2) To qualify for an asbestos supervisor certificate, an individual must meet the following criteria:

(a) Have at least 1600 hours of experience in one or more of the following disciplines:

(i) Asbestos abatement;

(ii) Asbestos project design;

(iii) Consultation on asbestos abatement projects;

(iv) Operations and maintenance program supervision;

(v) Construction project supervision;

(b) Possess a valid and current Washington state asbestos worker certificate;

(c) Successfully complete an approved asbestos supervisor training course;

(d) Achieve a score of at least seventy percent on a one hundred question multiple choice examination approved by the department but administered by the training course sponsor;

(e) Submit to the department a timely application validated by an approved training course sponsor. To be considered timely, an application must be received by the department not later than sixty days after the completion of the course. In the event that an application is not timely, the individual shall be required to pass, with a score of at least seventy percent, an examination administered by the department. A nonrefundable fifty dollar assessment shall be charged to take this examination; and

(f) Pay the fee prescribed in WAC 296-65-025.

(3) An individual shall not supervise any asbestos project prior to issuance of the certificate.

(4) Certificates shall be issued and mailed to the individual applicants and shall be valid for one year from the date of issuance.

(5) A certified asbestos supervisor shall attend a seven-hour supervisor refresher course prior to certificate renewal. It shall not be necessary to also take a worker refresher course.

(a) The course shall, at a minimum, adequately review the subjects required by WAC 296-65-007, update information on state-of-the-art procedures and equipment, and review regulatory changes and interpretations. Specific subjects may be required by the department.

(b) An application for renewal of the certificate must be validated by the refresher training course instructor.

(c) The refresher course must be taken prior to expiration of the certificate but may not be taken more than sixty days prior to expiration of the original or current certificate.

(d) The certificate renewal application must be received by the department no later than the expiration



date of the current certificate. Applicants missing this renewal deadline shall be required to pass, with a score of seventy percent, an examination administered by the department. A nonrefundable fifty dollar fee will be charged to take this examination.

(e) Individuals whose certificates have been expired for more than six months will be required to retake the entire thirty-hour basic course.

(6) The certificate shall be available for inspection at all times during an asbestos project.

(7) The department may suspend or revoke a certificate as provided in WAC 296-65-050 and chapter 296-350 WAC.

(8) Individuals who have completed the "competent person" training previously recognized by the department after January 1, 1987, need not comply with the requirements set forth in subsection (2) of this section and shall be issued asbestos supervisor certificates provided the following conditions are met:

(a) Be a certified asbestos worker as prescribed in WAC 296-65-010 for at least one year;

(b) Provide documentation of successful completion of a recognized "competent person" training course;

(c) Pass, with a score of at least seventy percent, an examination administered by the department. A nonrefundable fifty dollar assessment shall be charged to take this examination; and

(d) This subsection shall expire on June 30, 1990. Thereafter any individual who has completed "competent person" training shall obtain an asbestos supervisor certificate by complying with the requirements set forth in subsection (2) of this section.

[Statutory Authority: Chapter 49.17 RCW. 89-21-018 (Order 89-10), § 296-65-012, filed 10/10/89, effective 11/24/89.]

**WAC 296-65-015 Training course approval.** (1) Basic and refresher asbestos training courses may be sponsored by any individual, person, or other entity having department approval. Approval shall be contingent on the sponsor's compliance, as applicable, with licensing requirements established by the state board of vocational education.

(2) Prior to receiving department approval, each course shall be evaluated by the department for the breadth of knowledge and experience required to properly train asbestos workers or supervisors. Course content shall be carefully scrutinized for adequacy and accuracy. Training techniques will be evaluated by the department.

(3) Sponsors of basic and refresher training courses proposed for approval must submit:

(a) Background information about course sponsors;

(b) Course locations and fees;

(c) Copies of course handouts;

(d) A detailed description of course content and the amount of time allotted to each major topic;

(e) A description of teaching methods to be utilized and a list of all audio-visual materials; the department may, in its discretion, request that copies of the materials be provided for review. Any audio-visual materials

provided to the department will be returned to the applicant;

(f) A list of all personnel involved in course preparation and presentation and a description of the background, special training and qualifications of each. The department may, in its discretion, require proposed instructors to pass an examination on subjects related to their respective topics of instruction;

(g) A description of student evaluation methods and a copy of the required written examination including the scoring methodology to be used in grading the examination;

(h) A description of course evaluation methods; and

(i) Any restrictions on attendance (language, class size, affiliation, etc.).

(4) Application for training course approval and course materials shall be submitted to the department at least sixty days prior to the requested approval date. Materials may be mailed to:

Asbestos Certification Program  
Department of Labor and  
Industries, HC-412  
805 Plum Street S.E.  
P.O. Box 207  
Olympia, Washington 98504

(5) The decision to grant or renew approval of a basic or refresher asbestos training course shall be in the sole discretion of the department.

Following approval of a basic or refresher asbestos training course, the department will issue the course sponsor an approval which is valid for one year from the date of issuance. Application for renewal must follow the procedures described in subsections (3) and (4) of this section.

Following approval of a basic or refresher asbestos training course, in recognition that asbestos abatement is an evolving industry, the department reserves the right to require additional subjects to be taught and to specify the amount of time which shall be allotted to adequately cover required subjects. To assure adequate coverage of required material, each sponsor shall be provided and required to incorporate into their training course, a detailed outline of subject matter developed by the department.

(6) To be considered timely, the training course approval renewal must be received by the department no later than thirty days before the certificate expiration date.

(7) Any changes to a training course must be approved by the department in advance.

(8) The course sponsor shall provide the department with a list of all persons who have completed a basic or refresher training course. The list must be provided no later than ten days after a course is completed and must include the name and address of each trainee.

(9) The course sponsor must notify the department, in writing, at least fourteen days before a training course is scheduled to begin. The notification must include the date, time and address where the training will be conducted.

(10) A representative of the department may, at the department's discretion, attend a training course as an observer to verify that the training course is conducted in accordance with the program approved by the department.

(11) Course sponsors conducting training outside the state of Washington shall reimburse the department for reasonable travel expenses associated with department audits of the training courses. Reasonable travel expenses are defined as current state of Washington per diem and travel allowance rates including airfare and/or surface transportation rates. Such reimbursement shall be paid within thirty days of receipt of the billing notice.

(12) The training course sponsor shall limit each class to a maximum of thirty participants.

(13) The instructor to student ratio shall not exceed one-to-ten for any of the training required by WAC 296-65-005(13).

(14) The department may terminate the training course approval, if in the department's judgment the sponsor fails to maintain the course content and quality as initially approved, or fails to make changes to a course as required by WAC 296-65-015(5).

Any "notice of termination of training course approval" issued by the department may act as an order of immediate restraint as described by RCW 49.17.130.

[Statutory Authority: Chapter 49.17 RCW. 89-21-018 (Order 89-10), § 296-65-015, filed 10/10/89, effective 11/24/89; 87-24-051 (Order 87-24), § 296-65-015, filed 11/30/87. Statutory Authority: RCW 49.17.050(2) and 49.17.040. 87-10-008 (Order 87-06), § 296-65-015, filed 4/27/87. Statutory Authority: SSB 4209, 1985 c 387, 85-21-080 (Order 85-30), § 296-65-015, filed 10/22/85.]

**WAC 296-65-017 Contractor certification.** (1) In order to obtain certification, an asbestos contractor must submit an application to the department. The application shall provide the following information:

(a) A list of asbestos projects conducted by the contractor during the previous twelve months. Such list shall include for each project:

- (i) Project name;
- (ii) Location;
- (iii) Brief description;

(iv) Identity of any citations or enforcement actions issued for violations of asbestos regulations by any local, state, or federal jurisdiction relative to each individual project; and

(v) Name of the on-site project manager or supervisor.

(b) A list of asbestos supervisors (include certification number) working for the company.

(c) A statement certifying that the contractor has read and understands all applicable Washington state rules and regulations regarding asbestos abatement and will comply with them.

(d) A statement certifying that the applicant contractor's asbestos license or accreditation issued by any other state or jurisdiction has not been revoked, suspended, or denied by that state or jurisdiction.

(2) Upon approval, the department will issue the contractor a certificate. Denial of approval shall be in writing.

(3) Certificates shall be valid for a period of twelve months. Certificates may be extended during department review of a renewal application.

Note: In circumstances where it is necessary to coordinate an expiration date with the date of expiration of a contractor registration issued under chapter 18.27 RCW, certificates may be valid for less than one year. In such circumstances, the certificate fee prescribed in WAC 296-65-025 shall be prorated accordingly for the initial application only.

(4) The application for certificate renewal shall contain the information specified in subsection (1) of this section.

(5) Applications for renewal must be received by the department not less than sixty days before the certificate expires.

(6) The department may suspend or revoke the certificate as provided in WAC 296-65-050 and chapter 296-350 WAC.

[Statutory Authority: Chapter 49.17 RCW. 89-21-018 (Order 89-10), § 296-65-017, filed 10/10/89, effective 11/24/89.]

**WAC 296-65-020 Notification requirements.** (1) Before any person or individual begins an asbestos project involving more than forty-eight square feet or ten linear feet, unless the surface area of the pipe is greater than forty-eight square feet, of asbestos containing material, written notification shall be provided to the department. Notices shall include:

(a) Name and address of the owner and contractor.  
(b) Description of the facility including size, age, and prior use of the facility.

(c) Amount of asbestos-containing material to be removed or encapsulated.

(d) Location of the facility.

(e) Exact starting and completion dates of the asbestos project, including shifts during which abatement work will be accomplished. These dates must correspond to the dates specified in the contract. Any change in these dates or work shifts shall be communicated to the department by an amended notice.

(f) Nature of the project and methods used to remove or encapsulate the material.

(2) Failure to provide such notification will result in the loss of the exemption specified in WAC 296-65-030.

(3) Notices must be received by the department no later than ten days prior to the start of the project. Notices shall be sent directly to the department of labor and industries regional office having jurisdiction on the project.

(4) The director may waive the prenotification requirement upon written request of an owner for large-scale, on-going projects. In granting such a waiver, the director shall require the owner to provide prenotification if significant changes in personnel, methodologies, equipment, work site, or work procedures occur or are likely to occur. The director shall further require annual resubmittal of such notification.

(5) The director, upon review of an owner's reports, work practices, or other data available as a result of inspections, audits, or other authorized activities, may reduce the size threshold for prenotification required by

this section. Such a change shall be based on the director's determination that significant problems in personnel, methodologies, equipment, work site, or work procedures are creating the potential for violations of this chapter.

(6) Emergency projects which disturb or release asbestos into the air shall be reported to the department within three working days after commencement of the project in the manner otherwise required under this chapter. The employees, the employees' collective bargaining representative or employee representative, if any, and other persons at the project area shall be notified of the emergency as soon as possible by the person undertaking the emergency project. A notice describing the nature of the emergency project shall be clearly posted adjacent to the work area.

(7) Incremental phasing in the conduct or design of asbestos projects or otherwise conducting or designing asbestos projects of a size less than the threshold exemption specified in subsection (1) of this section, with the intent of avoiding the notification requirements, is a violation of this chapter.

[Statutory Authority: Chapter 49.17 RCW. 89-21-018 (Order 89-10), § 296-65-020, filed 10/10/89, effective 11/24/89; 87-24-051 (Order 87-24), § 296-65-020, filed 11/30/87. Statutory Authority: RCW 49.17.050(2) and 49.17.040. 87-10-008 (Order 87-06), § 296-65-020, filed 4/27/87. Statutory Authority: SSB 4209, 1985 c 387, 85-21-080 (Order 85-30), § 296-65-020, filed 10/22/85.]

**WAC 296-65-025 Fees.** (1) A nonrefundable administrative fee of twenty-five dollars shall be assessed for each initial or renewal asbestos worker certificate application. The fee (check or money order) must accompany the certificate application and be made payable to the department. An application form may be obtained from any approved training course instructor or directly from the department.

(2) A nonrefundable administrative fee of thirty-five dollars shall be assessed for each initial or renewal asbestos supervisor certificate application. The fee (check or money order) must accompany the certificate application and be made payable to the department. An application form may be obtained from any approved training course instructor or directly from the department.

(3) A nonrefundable administrative fee of one thousand dollars shall be assessed for each initial or renewal contractor certificate application. The fee (check or money order) must accompany the certificate application and be made payable to the department. An application form may be obtained from the department.

**Note:** In circumstances where it is necessary to coordinate an expiration date with the date of expiration of a contractor registration issued under chapter 18.27 RCW, certificates may be valid for less than one year. In such circumstances, the certificate fee prescribed in WAC 296-65-025 shall be prorated accordingly for the initial application only.

(4) A nonrefundable administrative fee of one thousand dollars shall be assessed for each initial and renewal application for training course approval. A check or money order shall accompany any application made under the provisions of WAC 296-65-015.

[Statutory Authority: Chapter 49.17 RCW. 89-21-018 (Order 89-10), § 296-65-025, filed 10/10/89, effective 11/24/89; 87-24-051 (Order 87-24), § 296-65-025, filed 11/30/87. Statutory Authority: SSB 4209, 1985 c 387, 85-21-080 (Order 85-30), § 296-65-025, filed 10/22/85.]

**WAC 296-65-030 Methods of compliance.** (1) Before submitting a bid or working on an asbestos abatement project, any person or individual shall obtain an asbestos contractor certificate as provided in WAC 296-65-017 and shall have in its employ at least one certified asbestos supervisor responsible for supervising all asbestos projects undertaken by the contractor.

(2) A certified asbestos supervisor will not be required on projects involving less than forty-eight square feet or ten linear feet of asbestos-containing material unless the surface area of the pipe is greater than forty-eight square feet.

(3) No employee or other individual is eligible to do work or supervise an asbestos project without being issued a certificate by the department except, in the case of an asbestos project undertaken by any partnership, firm, association, corporation, or sole proprietorship, and conducted in its own facility and by its own employees under the direct, on-site supervision of a certified asbestos supervisor. This exception does not apply to the state of Washington or its political subdivisions.

(4) No person may assign any employee, contract with, or permit any individual, to remove or encapsulate asbestos in any facility without the project being performed by a certified asbestos worker and under the direct, on-site supervision of a certified asbestos supervisor, except in the case of an asbestos project undertaken by any partnership, firm, association, corporation, or sole proprietorship, and conducted in its own facility and by its own employees under the direct, on-site supervision of a certified asbestos supervisor.

(5) Any partnership, firm, association, corporation, or sole proprietorship that begins any construction, renovation, remodeling, maintenance, repair, or demolition project without meeting the requirements of WAC 296-62-07707 and the notification requirements as provided in subsection (6) of this section, shall lose the exemptions provided in subsections (3) and (4) of this section.

(6) In cases excepted under subsections (3) and (4) of this section:

(a) Direct, on-site supervision by a certified asbestos supervisor shall be required for asbestos projects performed at one project location by workers who are not certified.

(b) If a project is conducted using only certified workers, or if a certified worker functions as a foreman or lead person, supervision can be performed in the regular course of a supervisor's duties and need not be direct and on-site.

(c) The partnership, firm, association, corporation, or sole proprietorship shall annually submit, to the department, a written description which includes at least the following information:

(i) The kinds of asbestos projects expected to be undertaken during a period of time not to exceed one year from the date of submission;

(ii) The procedures to be used in undertaking the asbestos projects;

(iii) Methods of compliance with applicable department regulations;

(iv) Methods of compliance with any additional procedures required by law for the safe demolition, removal, encapsulation, salvage, and disposal of asbestos;

(v) A copy of the written inspection report or statement as required by WAC 296-62-07707; and

(vi) The name, address and certification number of the supervising certified asbestos supervisor.

(7) The written descriptions required in this section shall be submitted to the department prior to commencing any project described.

(8) A further written description must be submitted to the department prior to commencing a project, if previously unidentified or new asbestos projects are proposed during the one year period covered by the written description submitted to the department in accordance with subsection (6) of this section.

(9) Written descriptions, shall be mailed to:

Asbestos Certification Program,  
Department of Labor and  
Industries, HC-412  
805 Plum Street S.E.  
P.O. Box 207  
Olympia, Washington 98504.

(10) In addition to losing the exemption in subsection (5) of this section, any partnership, firm, association, corporation, or sole proprietorship who fails to comply with subsections (6) through (9) of this section shall be subject to a mandatory fine of not less than two hundred fifty dollars for each violation. Each day the violation continues shall be considered a separate violation. In addition, any construction, renovation, remodeling, maintenance, repair, or demolition which was started without meeting the requirements of this section shall be halted immediately and cannot be resumed before meeting such requirements.

[Statutory Authority: Chapter 49.17 RCW. 89-21-018 (Order 89-10), § 296-65-030, filed 10/10/89, effective 11/24/89. Statutory Authority: RCW 49.17.050(2) and 49.17.040. 87-10-008 (Order 87-06), § 296-65-030, filed 4/27/87. Statutory Authority: SSB 4209, 1985 c 387. 85-21-080 (Order 85-30), § 296-65-030, filed 10/22/85.]

**WAC 296-65-035 Reciprocity.** (1) The department may recognize certifications issued by another state for asbestos workers or supervisors provided that:

(a) The worker is in possession of a currently valid certification from the other state; and

(b) The department evaluates the other state's qualification procedures and determines the certification to be equivalent to the minimum requirements of this chapter.

(2) When the department's evaluation of another state's qualification procedures identifies that equivalent requirements are met, the department is authorized to issue a Washington state certification upon receipt of a completed application.

(3) When the department's evaluation of another state's qualification procedures identifies deficiencies,

the department may require specific supplemental training and/or examination before issuing a Washington state certification.

[Statutory Authority: Chapter 49.17 RCW. 89-21-018 (Order 89-10), § 296-65-035, filed 10/10/89, effective 11/24/89.]

**WAC 296-65-050 Denial, suspension, and revocation of certificates.** (1) The department may deny, suspend, or revoke a certificate for failure of the holder to comply with any requirement of this chapter or any applicable health and safety standards and regulations.

(2) In addition to any civil penalty imposed under WAC 296-62-07707 and 296-65-030, the department may suspend or revoke any certificate issued under this chapter for a period of not less than six months upon the following grounds:

(a) The certificate was obtained through error or fraud; or

(b) The holder thereof is judged to be incompetent to carry out the work for which the certificate was issued.

(3) Before any certificate may be denied, suspended, or revoked, the holder thereof shall be given written notice of the department's intention to do so, mailed by registered mail, return receipt requested, to the holder's last known address. The notice shall enumerate the allegations against such holder and shall give him or her the opportunity to request a conference before the department. At such conference, the department and the holder shall have opportunity to produce witnesses and give testimony.

(4) A denial, suspension, or revocation order may be appealed to the board of industrial insurance appeals within fifteen working days after the denial, suspension, or revocation order is entered. The notice of appeal may be filed with the department or the board of industrial insurance appeals. The board of industrial insurance appeals shall hold the hearing in accordance with procedures established in RCW 49.17.140. Any party aggrieved by an order of the board of industrial insurance appeals may obtain superior court review in the manner provided in RCW 49.17.150.

[Statutory Authority: Chapter 49.17 RCW. 89-21-018 (Order 89-10), § 296-65-050, filed 10/10/89, effective 11/24/89.]

## Chapter 296-78 WAC

### SAFETY STANDARDS FOR SAWMILLS AND WOODWORKING OPERATIONS

#### WAC

296-78-500	Foreword.
296-78-505	Definitions applicable to this chapter.
296-78-510	Education and first-aid standards.
296-78-515	Management's responsibility.
296-78-520	Employee's responsibility.
296-78-525	Accident prevention programs.
296-78-530	Safety and health committee plan.
296-78-535	Safety bulletin board.
296-78-540	First-aid training and certification.
296-78-545	First-aid kit.
296-78-550	First-aid station.
296-78-555	First-aid room.
296-78-560	Safe place standards.
296-78-565	Log dumps and ponds—Headmills.

296-78-56501 Log dumps and ponds.  
 296-78-56503 Log hauls.  
 296-78-56505 Boats and mechanical devices on waters.  
 296-78-56507 Log decks.  
 296-78-56509 Mechanical barkers.  
 296-78-56511 Head rigs and feed works.  
 296-78-56513 Log carriages.  
 296-78-570 Band saws—Saws.  
 296-78-575 Circular saws.  
 296-78-580 Edgers.  
 296-78-585 Equalizer saws.  
 296-78-590 Gang saws and re-saws.  
 296-78-595 Jump saws.  
 296-78-600 Trimmer and slasher saws.  
 296-78-605 Swing saws.  
 296-78-610 Circular saws, speeds, repairs.  
 296-78-615 Saw filing and grinding rooms and equipment.  
 296-78-620 Miscellaneous woodworking machines—Planers, stickers, molders, matchers.  
 296-78-625 Planers (stave and headings).  
 296-78-630 Stave croziers.  
 296-78-635 Jointers.  
 296-78-640 Jointers (stave and heading).  
 296-78-645 Wood shapers.  
 296-78-650 Boring and mortising machines.  
 296-78-655 Tenoning machines.  
 296-78-660 Lathe (pail and barrel).  
 296-78-665 Sanding machines.  
 296-78-670 Glue machines.  
 296-78-675 Lath mills.  
 296-78-680 Veneer and plywood plants—Peeling and barking.  
 296-78-685 Veneer lathe.  
 296-78-690 Veneer slicer and cutter.  
 296-78-695 Veneer clipper.  
 296-78-700 Veneer wringer (swede).  
 296-78-705 The shake and shingle industry.  
 296-78-70501 Definitions—Terms, general.  
 296-78-70503 Shake and shingle machinery—General.  
 296-78-70505 Shake machinery.  
 296-78-70507 Upright shingle machine.  
 296-78-70509 Related shake and shingle sawing machinery.  
 296-78-70511 Safety rules.  
 296-78-710 Construction and isolated equipment.  
 296-78-71001 General.  
 296-78-71003 Floor openings.  
 296-78-71005 Floors, docks, platforms and runways.  
 296-78-71007 Footwalks and passageways.  
 296-78-71009 Stairways and ladders.  
 296-78-71011 Egress and exit.  
 296-78-71013 Cableways.  
 296-78-71015 Tanks and chemicals.  
 296-78-71017 Dry kilns.  
 296-78-71019 Exhaust systems.  
 296-78-71021 Spray painting.  
 296-78-71023 Lighting.  
 296-78-71025 Gas piping and appliances.  
 296-78-715 Mechanical, steam and electrical equipment.  
 296-78-71501 General provisions.  
 296-78-71503 Lock out—Tag out.  
 296-78-71505 Mechanical power transmission apparatus.  
 296-78-720 Boiler and pressure vessels.  
 296-78-725 Nonionizing radiation.  
 296-78-730 Electrical service and equipment.  
 296-78-735 Elevators, moving walks.  
 296-78-740 Transportation—Lumber handling equipment—Cranes—Construction.  
 296-78-745 Electrical equipment.  
 296-78-750 Chains, wire rope, cables and fiber rope.  
 296-78-755 Natural and synthetic fiber rope slings.  
 296-78-760 Synthetic web slings.  
 296-78-765 Floor operated cranes.  
 296-78-770 Operators.  
 296-78-775 Signalpersons.  
 296-78-780 Repairpersons.  
 296-78-785 Construction requirements.  
 296-78-790 Crane platforms and footwalks.

296-78-795 Crane cages.  
 296-78-800 Crane rail stops, bumpers and fenders.  
 296-78-805 Crawler locomotive and truck cranes.  
 296-78-810 Chain and electric hoists.  
 296-78-815 Monorail hoists.  
 296-78-820 Air hoists.  
 296-78-825 Jib, pillar, and portable floor cranes, crabs, and winches.  
 296-78-830 Standard crane hand signals—Illustrations.  
 296-78-835 Vehicles.  
 296-78-840 Loading, piling, storage and conveying.  
 296-78-84001 Loading, piling, storage and conveying—General.  
 296-78-84003 Conveyors.  
 296-78-84005 Dry kilns.  
 296-78-84007 Chippers and logs.  
 296-78-84009 Bins and bunkers.  
 296-78-84011 Burners.

#### DISPOSITION OF SECTIONS FORMERLY CODIFIED IN THIS CHAPTER

296-78-005 Foreword. [Order 76-7, § 296-78-005, filed 3/1/76; Order 74-28, § 296-78-005, filed 5/7/74; Foreword, effective 6/1/51, filed 3/23/60.] Repealed by 81-18-029 (Order 81-21), filed 8/27/81. Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240.  
 296-78-007 Definitions applicable to this chapter. [Order 74-28, § 296-78-007, filed 5/7/74.] Repealed by 81-18-029 (Order 81-21), filed 8/27/81. Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240.  
 296-78-010 General safety standards. [Rules A-1 through A-19, effective 6/1/51, filed 3/23/60.] Repealed by Order 74-28, filed 5/7/74 and Order 76-7, filed 3/1/76.  
 296-78-015 Minimum requirements for first aid. [Rule B-1, effective 6/1/51, filed 3/23/60.] Repealed by Order 74-28, filed 5/7/74 and Order 76-7, filed 3/1/76.  
 296-78-020 First-aid kit. [Rule B-2, effective 6/1/51, filed 3/23/60.] Repealed by Order 74-28, filed 5/7/74 and Order 76-7, filed 3/1/76.  
 296-78-025 First-aid room. [Rule B-3, effective 6/1/51, filed 3/23/60.] Repealed by Order 74-28, filed 5/7/74 and Order 76-7, filed 3/1/76.  
 296-78-030 Construction and isolated equipment. [Order 77-12, § 296-78-030, filed 7/11/77; Order 76-7, § 296-78-030, filed 3/1/76; Order 74-28, § 296-78-030, filed 5/7/74; Rules C-1 through C-61, effective 6/1/51, filed 3/23/60.] Repealed by 81-18-029 (Order 81-21), filed 8/27/81. Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240.  
 296-78-035 Mechanical, steam and electrical equipment—General provisions. [Order 74-28, § 296-78-035, filed 5/7/74; Rules D-1 through D-19, effective 6/1/51, filed 3/23/60.] Repealed by 81-18-029 (Order 81-21), filed 8/27/81. Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240.  
 296-78-040 Boiler and pressure vessels. [Order 74-28, § 296-78-040, filed 5/7/74; Rule D-20, effective 6/1/51, filed 3/23/60.] Repealed by 81-18-029 (Order 81-21), filed 8/27/81. Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240.  
 296-78-045 Electrical service and equipment. [Order 74-28, § 296-78-045, filed 5/7/74; Rule D-21, effective 6/1/51, filed 3/23/60.] Repealed by 81-18-029 (Order 81-21), filed 8/27/81. Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240.  
 296-78-050 Electrical utilization—Definitions. [Rule D-22, effective 6/1/51, filed 3/23/60.] Repealed by Order 74-28, filed 5/7/74 and Order 76-7, filed 3/1/76.  
 296-78-055 Electrical utilization—General requirements—Safety. [Rule D-23, effective 6/1/51, filed 3/23/60.] Repealed by Order 74-28, filed 5/7/74 and Order 76-7, filed 3/1/76.  
 296-78-060 Electrical utilization—General requirements—Current. [Rule D-24, effective 6/1/51, filed 3/23/60.] Repealed by Order 74-28, filed 5/7/74 and Order 76-7, filed 3/1/76.

- 296-78-065 Electrical utilization—General requirements—Grounding. [Rule D-25, effective 6/1/51, filed 3/23/60.] Repealed by Order 74-28, filed 5/7/74 and Order 76-7, filed 3/1/76.
- 296-78-070 Electrical utilization—General requirements—Circuits to be grounded. [Rule D-26, effective 6/1/51, filed 3/23/60.] Repealed by Order 74-28, filed 5/7/74 and Order 76-7, filed 3/1/76.
- 296-78-075 Electrical utilization—General requirements—Grounding noncurrent-carrying metal parts. [Rule D-27, effective 6/1/51, filed 3/23/60.] Repealed by Order 74-28, filed 5/7/74 and Order 76-7, filed 3/1/76.
- 296-78-080 Electrical utilization—Working spaces about electrical equipment—Dimensions. [Rule D-28, effective 6/1/51, filed 3/23/60.] Repealed by Order 74-28, filed 5/7/74 and Order 76-7, filed 3/1/76.
- 296-78-085 Electrical utilization—Guarding or isolating live parts—Inclosure or elevation. [Rule D-29, effective 6/1/51, filed 3/23/60.] Repealed by Order 74-28, filed 5/7/74 and Order 76-7, filed 3/1/76.
- 296-78-090 Electrical utilization—Separation and barriers. [Rule D-30, effective 6/1/51, filed 3/23/60.] Repealed by Order 74-28, filed 5/7/74 and Order 76-7, filed 3/1/76.
- 296-78-095 Electrical utilization—Hazardous locations. [Rule D-31, effective 6/1/51, filed 3/23/60.] Repealed by Order 74-28, filed 5/7/74 and Order 76-7, filed 3/1/76.
- 296-78-100 Electrical utilization—Suitability and size of conductors. [Rule D-32, effective 6/1/51, filed 3/23/60.] Repealed by Order 74-28, filed 5/7/74 and Order 76-7, filed 3/1/76.
- 296-78-105 Electrical utilization—Fuses and circuit breakers. [Rule D-33, effective 6/1/51, filed 3/23/60.] Repealed by Order 74-28, filed 5/7/74 and Order 76-7, filed 3/1/76.
- 296-78-110 Electrical utilization—General requirements for switches—Accessibility, marking and installation. [Rule D-34, effective 6/1/51, filed 3/23/60.] Repealed by Order 74-28, filed 5/7/74 and Order 76-7, filed 3/1/76.
- 296-78-115 Electrical utilization—Guarding switches. [Rule D-35, effective 6/1/51, filed 3/23/60.] Repealed by Order 74-28, filed 5/7/74 and Order 76-7, filed 3/1/76.
- 296-78-120 Electrical utilization—Platforms and mats. [Rule D-36, effective 6/1/51, filed 3/23/60.] Repealed by Order 74-28, filed 5/7/74 and Order 76-7, filed 3/1/76.
- 296-78-125 Electrical utilization—Switchboards and panelboards—Control or arrangement. [Rule D-37, effective 6/1/51, filed 3/23/60.] Repealed by Order 74-28, filed 5/7/74 and Order 76-7, filed 3/1/76.
- 296-78-130 Electrical utilization—Inclosure of parts. [Rule D-38, effective 6/1/51, filed 3/23/60.] Repealed by Order 74-28, filed 5/7/74 and Order 76-7, filed 3/1/76.
- 296-78-135 Electrical utilization—Motors and motor-driven machinery—Grounding machine frames. [Rule D-39, effective 6/1/51, filed 3/23/60.] Repealed by Order 74-28, filed 5/7/74 and Order 76-7, filed 3/1/76.
- 296-78-140 Electrical utilization—Mats and platforms. [Rule D-40, effective 6/1/51, filed 3/23/60.] Repealed by Order 74-28, filed 5/7/74 and Order 76-7, filed 3/1/76.
- 296-78-145 Electrical utilization—Water barrel rheostats prohibited. [Rule D-41, effective 6/1/51, filed 3/23/60.] Repealed by Order 74-28, filed 5/7/74 and Order 76-7, filed 3/1/76.
- 296-78-150 Electrical utilization—Employees—Safety requirements. [Rule D-42, effective 6/1/51, filed 3/23/60.] Repealed by Order 74-28, filed 5/7/74 and Order 76-7, filed 3/1/76.
- 296-78-155 Electrical utilization—"Bridging" fuses prohibited. [Rule D-43, effective 6/1/51, filed 3/23/60.] Repealed by Order 74-28, filed 5/7/74 and Order 76-7, filed 3/1/76.
- 296-78-160 Electrical utilization—Leakage of electricity shall be reported. [Rule D-44, effective 6/1/51, filed 3/23/60.] Repealed by Order 74-28, filed 5/7/74 and Order 76-7, filed 3/1/76.
- 296-78-162 Electrical utilization—Safe standing room required. [Rule D-45, effective 6/1/51, filed 3/23/60.] Repealed by Order 74-28, filed 5/7/74 and Order 76-7, filed 3/1/76.
- 296-78-165 Electrical utilization—Use of disconnected wires for starting machinery prohibited. [Rules D-46 through D-53, effective 6/1/51, filed 3/23/60.] Repealed by Order 74-28, filed 5/7/74 and Order 76-7, filed 3/1/76.
- 296-78-170 Elevators, moving walks and other lifting devices. [Order 76-29, § 296-78-170, filed 9/30/76; Order 74-28, § 296-78-170, filed 5/7/74; Rule D-54, effective 6/1/51, filed 3/23/60.] Repealed by 81-18-029 (Order 81-21), filed 8/27/81. Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240.
- 296-78-175 Platform hoists. [Rule D-55, effective 6/1/51, filed 3/23/60.] Repealed by Order 74-28, filed 5/7/74 and Order 76-7, filed 3/1/76.
- 296-78-180 Transportation—Lumber handling equipment—Cranes—Construction. [Order 74-28, § 296-78-180, filed 5/7/74; Rule E-1, effective 6/1/51, filed 3/23/60.] Repealed by 81-18-029 (Order 81-21), filed 8/27/81. Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240.
- 296-78-185 Electrical equipment. [Order 74-28, § 296-78-185, filed 5/7/74; Rule E-2, effective 6/1/51, filed 3/23/60.] Repealed by 81-18-029 (Order 81-21), filed 8/27/81. Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240.
- 296-78-190 Chains, wire rope, cables and fiber rope. [Order 74-28, § 296-78-190, filed 5/7/74; Rule E-3, effective 6/1/51, filed 3/23/60.] Repealed by 81-18-029 (Order 81-21), filed 8/27/81. Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240.
- 296-78-195 Floor operated cranes. [Order 74-28, § 296-78-195, filed 5/7/74; Rule E-4, effective 6/1/51, filed 3/23/60.] Repealed by 81-18-029 (Order 81-21), filed 8/27/81. Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240.
- 296-78-200 Operators. [Order 77-12, § 296-78-200, filed 7/11/77; Order 74-28, § 296-78-200, filed 5/7/74; Rule E-5, effective 6/1/51, filed 3/23/60.] Repealed by 81-18-029 (Order 81-21), filed 8/27/81. Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240.
- 296-78-205 Signalmen. [Order 74-28, § 296-78-205, filed 5/7/74; Rule E-6, effective 6/1/51, filed 3/23/60.] Repealed by 81-18-029 (Order 81-21), filed 8/27/81. Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240.
- 296-78-210 Repairmen. [Order 74-28, § 296-78-210, filed 5/7/74; Rule E-7, effective 6/1/51, filed 3/23/60.] Repealed by 81-18-029 (Order 81-21), filed 8/27/81. Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240.
- 296-78-215 Construction requirements. [Order 74-28, § 296-78-215, filed 5/7/74; Rule E-8, effective 6/1/51, filed 3/23/60.] Repealed by 81-18-029 (Order 81-21), filed 8/27/81. Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240.
- 296-78-220 Crane platforms and footwalks. [Order 74-28, § 296-78-220, filed 5/7/74; Rule E-9, effective 6/1/51, filed 3/23/60.] Repealed by 81-18-029 (Order 81-21), filed 8/27/81. Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240.
- 296-78-225 Crane cages. [Order 74-28, § 296-78-225, filed 5/7/74; Rule E-10, effective 6/1/51, filed 3/23/60.] Repealed by 81-18-029 (Order 81-21), filed



- 8/27/81. Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240.
- 296-78-230 Crane rail stops, bumpers and fenders. [Order 74-28, § 296-78-230, filed 5/7/74; Rule E-11, effective 6/1/51, filed 3/23/60.] Repealed by 81-18-029 (Order 81-21), filed 8/27/81. Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240.
- 296-78-235 Crawler locomotive and truck cranes. [Order 74-28, § 296-78-235, filed 5/7/74; Rule E-12, effective 6/1/51, filed 3/23/60.] Repealed by 81-18-029 (Order 81-21), filed 8/27/81. Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240.
- 296-78-240 Construction, operation and maintenance—Chain and electric hoists. [Order 74-28, § 296-78-240, filed 5/7/74; Rule E-13, effective 6/1/51, filed 3/23/60.] Repealed by 81-18-029 (Order 81-21), filed 8/27/81. Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240.
- 296-78-245 Monorail hoists. [Order 74-28, § 296-78-245, filed 5/7/74; Rule E-14, effective 6/1/51, filed 3/23/60.] Repealed by 81-18-029 (Order 81-21), filed 8/27/81. Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240.
- 296-78-250 Air hoists. [Order 74-28, § 296-78-250, filed 5/7/74; Rule E-15, effective 6/1/51, filed 3/23/60.] Repealed by 81-18-029 (Order 81-21), filed 8/27/81. Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240.
- 296-78-255 Jib, pillar, and portable floor cranes, crabs, and winches. [Order 74-28, § 296-78-255, filed 5/7/74; Rule E-16, effective 6/1/51, filed 3/23/60.] Repealed by 81-18-029 (Order 81-21), filed 8/27/81. Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240.
- 296-78-260 Standard crane hand signals—Illustration. [Order 74-28, § 296-78-260, filed 5/7/74; Rule E-17, effective 6/1/51, filed 3/23/60.] Repealed by 81-18-029 (Order 81-21), filed 8/27/81. Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240.
- 296-78-265 Vehicles. [Order 77-12, § 296-78-265, filed 7/11/77; Order 74-28, § 296-78-265, filed 5/7/74; Rules E-18 through E-39, effective 6/1/51, filed 3/23/60.] Repealed by 81-18-029 (Order 81-21), filed 8/27/81. Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240.
- 296-78-270 Loading, piling, storage and conveying. [Order 76-7, § 296-78-270, filed 3/1/76; Order 74-28, § 296-78-270, filed 5/7/74; Rules F-1 through F-43, effective 6/1/51, filed 3/23/60.] Repealed by 81-18-029 (Order 81-21), filed 8/27/81. Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240.
- 296-78-275 Log dumps and ponds—Headmills. [Order 76-7, § 296-78-275, filed 3/1/76; Order 74-28, § 296-78-275, filed 5/7/74; Rules G-1 through G-50, effective 6/1/51, filed 3/23/60.] Repealed by 81-18-029 (Order 81-21), filed 8/27/81. Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240.
- 296-78-280 Band saws—Saws. [Order 76-7, § 296-78-280, filed 3/1/76; Order 74-28, § 296-78-280, filed 5/7/74; Rule H-1, effective 6/1/51, filed 3/23/60.] Repealed by 81-18-029 (Order 81-21), filed 8/27/81. Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240.
- 296-78-285 Circular saws. [Order 74-28, § 296-78-285, filed 5/7/74; Rule H-2, effective 6/1/51, filed 3/23/60.] Repealed by 81-18-029 (Order 81-21), filed 8/27/81. Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240.
- 296-78-290 Edgers. [Order 77-12, § 296-78-290, filed 7/11/77; Order 76-7, § 296-78-290, filed 3/1/76; Order 74-28, § 296-78-290, filed 5/7/74; Rules H-3A through H-3J, effective 6/1/51, filed 3/23/60.] Repealed by 81-18-029 (Order 81-21), filed 8/27/81. Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240.
- 296-78-295 Equalizer saws. [Order 74-28, § 296-78-295, filed 5/7/74; Rule H-4, effective 6/1/51, filed 3/23/60.] Repealed by 81-18-029 (Order 81-21), filed 8/27/81. Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240.
- 296-78-300 Gang saws and re-saws. [Order 74-28, § 296-78-300, filed 5/7/74; Rule H-5, effective 6/1/51, filed 3/23/60.] Repealed by 81-18-029 (Order 81-21), filed 8/27/81. Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240.
- 296-78-305 Jump saws. [Order 74-28, § 296-78-305, filed 5/7/74; Rule H-6, effective 6/1/51, filed 3/23/60.] Repealed by 81-18-029 (Order 81-21), filed 8/27/81. Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240.
- 296-78-310 Saws—Shingle saws. [Rule H-7, effective 6/1/51, filed 3/23/60.] Repealed by Order 74-28, filed 5/7/74 and Order 76-7, filed 3/1/76.
- 296-78-315 Trimmer and slasher saws. [Order 74-28, § 296-78-315, filed 5/7/74; Rule H-8, effective 6/1/51, filed 3/23/60.] Repealed by 81-18-029 (Order 81-21), filed 8/27/81. Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240.
- 296-78-320 Barrel stave saws. [Order 74-28, § 296-78-320, filed 5/5/74; Rule H-9, effective 6/1/51, filed 3/23/60.] Repealed by 81-18-029 (Order 81-21), filed 8/27/81. Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240.
- 296-78-325 Swing saws. [Order 74-28, § 296-78-325, filed 5/7/74; Rule H-10, effective 6/1/51, filed 3/23/60.] Repealed by 81-18-029 (Order 81-21), filed 8/27/81. Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240.
- 296-78-330 Table saws. [Order 74-28, § 296-78-330, filed 5/7/74; Rule H-11, effective 6/1/51, filed 3/23/60.] Repealed by 81-18-029 (Order 81-21), filed 8/27/81. Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240.
- 296-78-335 Circular saws, speeds, repairs. [Order 74-28, § 296-78-335, filed 5/7/74; Rule H-12, effective 6/1/51, filed 3/23/60.] Repealed by 81-18-029 (Order 81-21), filed 8/27/81. Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240.
- 296-78-340 Saw filing and grinding rooms and equipment. [Order 74-28, § 296-78-340, filed 5/7/74; Rule H-13, effective 6/1/51, filed 3/23/60.] Repealed by 81-18-029 (Order 81-21), filed 8/27/81. Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240.
- 296-78-345 Miscellaneous woodworking machines—Planers, stickers, molders, matchers. [Order 74-28, § 296-78-345, filed 5/7/74; Rule I-1, effective 6/1/51, filed 3/23/60.] Repealed by 81-18-029 (Order 81-21), filed 8/27/81. Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240.
- 296-78-350 Planers (stave and heading). [Order 74-28, § 296-78-350, filed 5/7/74; Rule I-2, effective 6/1/51, filed 3/23/60.] Repealed by 81-18-029 (Order 81-21), filed 8/27/81. Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240.
- 296-78-355 Stave croziers. [Order 74-28, § 296-78-355, filed 5/7/74; Rule I-3, effective 6/1/51, filed 3/23/60.] Repealed by 81-18-029 (Order 81-21), filed 8/27/81. Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240.
- 296-78-360 Jointers. [Order 74-28, § 296-78-360, filed 5/7/74; Rule I-4, effective 6/1/51, filed 3/23/60.] Repealed by 81-18-029 (Order 81-21), filed 8/27/81. Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240.
- 296-78-365 Jointers (stave and heading). [Order 74-28, § 296-78-365, filed 5/7/74; Rule I-5, effective 6/1/51, filed 3/23/60.] Repealed by 81-18-029 (Order 81-21), filed 8/27/81. Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240.
- 296-78-370 Miscellaneous woodworking machines—Jointers—(Shingle). [Rule I-6, effective 6/1/51, filed 3/23/60.] Repealed by Order 74-28, filed 5/7/74 and Order 76-7, filed 3/1/76.



- 296-78-375 Wood shapers. [Order 74-28, § 296-78-375, filed 5/7/74; Rule 1-7, effective 6/1/51, filed 3/23/60.] Repealed by 81-18-029 (Order 81-21), filed 8/27/81. Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240.
- 296-78-380 Boring and mortising machines. [Order 74-28, § 296-78-380, filed 5/7/74; Rule 1-8, effective 6/1/51, filed 3/23/60.] Repealed by 81-18-029 (Order 81-21), filed 8/27/81. Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240.
- 296-78-385 Tenoning machines. [Order 74-28, § 296-78-385, filed 5/7/74; Rule 1-9, effective 6/1/51, filed 3/23/60.] Repealed by 81-18-029 (Order 81-21), filed 8/27/81. Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240.
- 296-78-390 Lathe (pail and barrel). [Order 74-28, § 296-78-390, filed 5/7/74; Rule 1-10, effective 6/1/51, filed 3/23/60.] Repealed by 81-18-029 (Order 81-21), filed 8/27/81. Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240.
- 296-78-395 Sanding machines. [Order 74-28, § 296-78-395, filed 5/7/74; Rule 1-11, effective 6/1/51, filed 3/23/60.] Repealed by 81-18-029 (Order 81-21), filed 8/27/81. Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240.
- 296-78-400 Glue machines. [Order 74-28, § 296-78-400, filed 5/7/74; Rule 1-12, effective 6/1/51, filed 3/23/60.] Repealed by 81-18-029 (Order 81-21), filed 8/27/81. Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240.
- 296-78-405 Lath mills. [Order 74-28, § 296-78-405, filed 5/7/74; Rule J-1, effective 6/1/51, filed 3/23/60.] Repealed by 81-18-029 (Order 81-21), filed 8/27/81. Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240.
- 296-78-410 Veneer and plywood plants—Peeling and barking. [Order 74-28, § 296-78-410, filed 5/7/74; Rule K-1, effective 6/1/51, filed 3/23/60.] Repealed by 81-18-029 (Order 81-21), filed 8/27/81. Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240.
- 296-78-415 Veneer lathe. [Order 74-28, § 296-78-415, filed 5/7/74; Rules K-2 through K-4, effective 6/1/51, filed 3/23/60.] Repealed by 81-18-029 (Order 81-21), filed 8/27/81. Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240.
- 296-78-420 Veneer slicer and cutter. [Order 74-28, § 296-78-420, filed 5/7/74; Rule K-5, effective 6/1/51, filed 3/23/60.] Repealed by 81-18-029 (Order 81-21), filed 8/27/81. Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240.
- 296-78-425 Veneer clipper. [Order 74-28, § 296-78-425, filed 5/7/74; Rule K-6, effective 6/1/51, filed 3/23/60.] Repealed by 81-18-029 (Order 81-21), filed 8/27/81. Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240.
- 296-78-430 Veneer wringer (swede). [Order 74-28, § 296-78-430, filed 5/7/74; Rule K-7, effective 6/1/51, filed 3/23/60.] Repealed by 81-18-029 (Order 81-21), filed 8/27/81. Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240.
- 296-78-450 The shake and shingle industry. [Order 76-7, § 296-78-450, filed 3/1/76; Order 74-28, § 296-78-450, filed 5/7/74.] Repealed by 81-18-029 (Order 81-21), filed 8/27/81. Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240.

**WAC 296-78-500 Foreword.** (1) General requirements. The chapter 296-78 WAC shall apply to and include safety requirements for all installations where the primary manufacturing of wood building products takes place. The installations may be a permanent fixed establishment or a portable operation. These operations shall include but are not limited to log and lumber handling, sawing, trimming and planing, plywood or veneer

manufacturing, canting operations, waste or residual handling, operation of dry kilns, finishing, shipping, storage, yard and yard equipment, and for power tools and affiliated equipment used in connection with such operation. WAC 296-78-450 shall apply to shake and shingle manufacturing. The provisions of WAC 296-78-500 through 296-78-84011 are also applicable in shake and shingle manufacturing except in instances of conflict with the requirements of WAC 296-78-705. (Rev. 1-28-76.)

(2) This standard shall augment the Washington state general safety and health standards, general occupational health standards, electrical workers safety rules, and any other standards which are applicable to all industries governed by chapter 80, Laws of 1973, Washington Industrial Safety and Health Act. In the event of any conflict between any portion of this chapter and any portion of any of the general application standards, the provisions of this chapter 296-78 WAC, shall apply.

(3) In exceptional cases where compliance with specific provisions of this chapter can only be accomplished to the serious detriment and disadvantage of an operation, variance from the requirement may be permitted by the director of the department of labor and industries after receipt of application for variance which meets the requirements of WAC 296-24-010, general safety and health standards.

(4) No safety program will run itself. To be successful, the wholehearted interest of the employees' group (labor unions) and management must not only be behind the program, but the fact must also be readily apparent to all.

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-500, filed 8/27/81.]

**WAC 296-78-505 Definitions applicable to this chapter.** (1) "A-frame" means a structure made of two independent columns fastened together at the top and separated at the bottom for stability.

(2) "Annealing" heating then cooling to soften and render less brittle.

(3) "Binder" a hinged lever assembly used to connect the ends of a wrapper to tighten the wrapper around the load of logs or materials.

(4) "Boom" logs or timbers fastened together end to end and used to contain floating logs. The term includes enclosed logs.

(5) "Brow log" a log placed parallel to a roadway at a landing or dump to protect vehicles while loading or unloading.

(6) "Bunk" a cross support for a load.

(7) "Cant" a log slabbed on one or more sides.

(8) "Carriage" (log carriage) a framework mounted on wheels which runs on tracts or in grooves in a direction parallel to the face of the saw, and which contains apparatus to hold a log securely and advance it toward the saw.

(9) "Carrier" an industrial truck so designed and constructed that it straddles the load to be transported

with mechanisms to pick up the load and support it during transportation.

(10) "Chipper" a machine which cuts material into chips.

(11) "Chock," "bunk block," and "cheese block" a wedge that prevents logs or loads from moving.

(12) "Cold deck" a pile of logs stored for future removal.

(13) "Crotch lines" two short lines attached to a hoisting line by a ring or shackle, the lower ends being attached to loading hooks.

(14) "Dog" (carriage dog) a steel tooth or assembly of steel teeth, one or more of which are attached to each carriage knee to hold log firmly in place on carriage.

(15) "Drag saw" a power-driven, reciprocating cross-cut saw mounted on suitable frame and used for bucking logs.

(16) "Head block" that part of a carriage which holds the log and upon which it rests. It generally consists of base, knee, taper set, and mechanism.

(17) "Head rig" a combination of head saw and log carriage used for the initial breakdown of logs into timbers, cants, and boards.

(18) "Hog" a machine for cutting or grinding slabs and other coarse residue from the mill.

(19) "Husk" a head saw framework on a circular mill.

(20) "Industrial truck" a mobile, power-driven vehicle used to carry, push or pull material. It is designed for "in-plant" or "on-site" use rather than highway use.

(21) "Kiln tender" the operator of a kiln.

(22) "Lift truck" an industrial truck used for lateral transportation and equipped with a power-operated lifting device, usually in the form of forks, for piling or un-piling lumber units or packages.

(23) "Live rolls" cylinders of wood or metal mounted on horizontal axes and rotated by power, which are used to convey slabs, lumber, and other wood products.

(24) "Loading boom" any structure projecting from a pivot point and intended to be used for lifting and guiding loads for the purpose of loading or unloading.

(25) "Log" a portion of a tree, usually a minimum of twelve feet in length, capable of being further processed into a variety of wood products.

(26) "Log deck" a platform in the sawmill on which the logs remain until needed for sawing.

(27) "Log haul" a conveyor for transferring logs to mill.

(28) "Lumber dimensions" the nominal size of surfaced lumber, unless otherwise stated.

(29) "Lumber hauling truck" an industrial truck, other than a lift truck or a carrier, used for the transport of lumber.

(30) "Package" a unit of lumber.

(31) "Peavy" a stout wooden handle fitted with a spike and hook and used for rolling logs.

(32) "Peeler block" a portion of a tree usually bucked in two foot intervals plus trim, to be peeled in a lathe or sliced in a slicer into veneer for further processing into plywood.

(33) "Pike pole" a long pole whose end is shod with a sharp pointed spike.

(34) "Pitman rod" connecting rod.

(35) "Resaw" band, circular, or sash gang saws used to break down slabs, cants, or flitches into lumber.

(36) "Running line" any moving rope as distinguished from a stationary rope such as a guyline.

(37) "Safety factor" a calculated reduction factor which may be applied to laboratory test values to obtain safe working stresses for wooden beams and other mechanical members; ratio of breaking load to safe load.

(38) "Saw guide" a device for steadying a circular or bandsaw.

(39) "Setwork" a mechanism on a sawmill carriage which enables an operator to move the log into position for another cut.

(40) "Sorting gaps" the areas on a log pond enclosed by boom sticks into which logs are sorted.

(41) "Spreader wheel" a metal wheel that separates the board from the log in back of circular saws to prevent binding.

(42) "Splitter" a knife-type, nonrotating spreader.

(43) "Sticker" a strip of wood or other material used to separate layers of lumber.

(44) "Stiff boom" the anchored, stationary boom sticks which are tied together and on which boom persons work.

(45) "Swifter" is a tying of boom sticks together to prevent them from spreading while being towed.

(46) "Telltale" a device used to serve as a warning for overhead objects.

(47) "Top saw" the upper of two circular saws on a head rig, both being on the same husk.

(48) "Tramway" a way for trams, usually consisting of parallel tracks laid on wooden beams.

(49) "Trestle" a braced framework of timbers, piles or steelwork for carrying a road or railroad over a depression.

(50) "Wrapper" a chain, strap or wire rope assembly used to contain a load of logs or materials.

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-505, filed 8/27/81.]

**WAC 296-78-510 Education and first-aid standards.** It shall be the duty of every employer to comply with such standards and systems of education for safety as shall be, from time to time, prescribed for such employer by the director of labor and industries through the division of industrial safety and health or by statute.

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-510, filed 8/27/81.]

**WAC 296-78-515 Management's responsibility.** (1) It shall be the responsibility of management to establish and supervise:

(a) A safe and healthful working environment.

(b) An accident prevention program as required by these standards.

(c) Training programs to improve the skill and competency of all employees in the field of occupational safety and health. Such training shall include the on-the-job instructions on the safe use of powered materials handling equipment, machine tool operations, use of

toxic materials and operation of utility systems prior to assignments to jobs involving such exposures.

(2) The employer shall develop and maintain a hazard communication program as required by WAC 296-62-054 through 296-62-05427 which will provide information to all employees relative to hazardous chemicals or substances to which they are exposed, or may become exposed, in the course of their employment.

(3) Management shall not assign mechanics, millwrights, or other persons to work on equipment by themselves when there is a probability that the person could fall from elevated work locations or equipment or that a person could be pinned down by heavy parts or equipment so that they could not call for or obtain assistance if the need arises.

Note: This subsection does not apply to operators of motor vehicles, watchmen or certain other jobs which, by their nature, are singular employee assignments. However, a definite procedure for checking the welfare of all employees during their working hours shall be instituted and all employees so advised.

(4) After the emergency actions following accidents that cause serious injuries that have immediate symptoms, a preliminary investigation of the cause of the accident shall be conducted. The investigation shall be conducted by a person designated by the employer, the immediate supervisor of the injured employee, witnesses, employee representative if available and any other person with the special expertise required to evaluate the facts relating to the cause of the accident. The findings of the investigation shall be documented by the employer for reference at any following formal investigation.

(5) Reporting of fatality or multiple hospitalization accidents.

(a) Within twenty-four hours after the occurrence of an employment accident which results in an immediate or probable fatality(s) or which results in the hospitalization of two or more employees, the employer of any employee so injured or killed shall report the accident, either orally or in writing, to the nearest office of the department. The reporting may be by telephone or telegraph. The reporting shall relate the circumstances of the accident, the number of fatalities, and the extent of any injuries. The director may require such additional reports, in writing or otherwise, as he deems necessary, concerning the accident.

(b) Equipment involved in an accident resulting in an immediate or probable fatality, shall not be moved, until a representative of the division of industrial safety and health investigates the accident and releases such equipment, except where removal is essential to prevent further accident. Where necessary to remove the victim, such equipment may be moved only to the extent of making possible such removal.

(c) Upon arrival of division of industrial safety and health investigator, employer shall assign to assist the investigator, the immediate supervisor and all employees who were witnesses to the accident, or whoever the investigator deems necessary to complete his investigation.

(6) A system for maintaining records of occupational injuries and illnesses as prescribed by chapter 296-27 WAC.

Note: Recordable cases include:

- (a) Every occupational death.
- (b) Every industrial illness.
- (c) Every occupational injury that involves one of the following:
  - (i) Unconsciousness.
  - (ii) Inability to perform all phases of regular job.
  - (iii) Inability to work full time on regular job.
  - (iv) Temporary assignment to another job.
  - (v) Medical treatment beyond first aid.

All employers with eleven or more employees shall record occupational injury and illness information on forms OSHA 101 - supplementary record occupational injuries and illnesses and OSHA 200 - log and summary. Forms other than OSHA 101 may be substituted for the supplementary record of occupational injuries and illnesses if they contain the same items.

[Statutory Authority: Chapter 49.17 RCW. 89-11-035 (Order 89-03), § 296-78-515, filed 5/15/89, effective 6/30/89. Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-515, filed 8/27/81.]

**WAC 296-78-520 Employee's responsibility.** (1) Employees shall coordinate and cooperate with all other employees in an attempt to eliminate accidents.

(2) Employees shall study and observe all safe practices governing their work.

(3) Employees should offer safety suggestions, wherein such suggestions may contribute to a safer work environment.

(4) Employees shall apply the principles of accident prevention in their daily work and shall use proper safety devices and protective equipment as required by their employment or employer.

(5) Employees shall properly care for all personal protective equipment.

(6) Employees shall make a prompt report to their immediate supervisor, of each industrial injury or occupational illness, regardless of the degree of severity.

(7) Employees shall not wear torn or loose clothing while working around machinery.

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-520, filed 8/27/81.]

**WAC 296-78-525 Accident prevention programs.** Each employer shall develop a formal accident-prevention program, tailored to the needs of the particular plant or operation and to the type of hazards involved. The division may be contacted for assistance in developing appropriate programs.

(1) The following are the minimal program elements for all employers:

(a) A safety orientation program describing the employer's safety program and including:

(i) How and when to report injuries, including instruction as to the location of first-aid facilities.

(ii) How to report unsafe conditions and practices.

(iii) The use and care of required personal protective equipment.

(iv) The proper actions to take in event of emergencies including the routes of exiting from areas during emergencies.

(v) Identification of the hazardous gases, chemicals or materials involved along with the instructions on the safe use and emergency action following accidental exposure.

(vi) A description of the employers total safety program.

(vii) An on-the-job review of the practices necessary to perform the initial job assignments in a safe manner.

(b) A designated safety and health committee consisting of management and employee representatives with the employee representatives being elected or appointed by fellow employees.

(2) Each accident-prevention program shall be outlined in written format.

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-525, filed 8/27/81.]

**WAC 296-78-530 Safety and health committee plan.** (1) All employers of eleven or more employees, shall have a designated safety committee composed of employer and employee elected members.

(a) The terms of employee-elected members shall be a maximum of one year. Should a vacancy occur on the committee, a new member shall be elected prior to the next scheduled meeting.

(b) The number of employer-selected members shall not exceed the number of employee-elected members.

(2) The safety committee shall have an elected chairperson.

(3) The safety committee shall be responsible for determining the frequency of committee meetings.

Note: If the committee vote on the frequency of safety meetings is stalemated, the division's regional safety educational representative may be consulted for recommendations.

(a) The committee shall be responsible for determining the date, hour and location of the meetings.

(b) The length of each meeting shall not exceed one hour except by majority vote of the committee.

(4) Minutes of each committee meeting shall be prepared and filed for a period of at least one year and shall be made available for review by noncompliance personnel of the division of industrial safety and health.

(5) Safety and health committee meetings shall address the following:

(a) A review of the safety and health inspection reports to assist in correction of identified unsafe conditions or practices.

(b) An evaluation of the accident investigations conducted since the last meeting to determine if the cause of the unsafe acts or unsafe conditions involved was properly identified and corrected.

(c) An evaluation of the accident or illness prevention program with the discussion of recommendation for improvement where indicated.

(d) The attendance shall be documented.

(e) The subject(s) discussed shall be documented.

(6) All employers of ten or less employees and employers of eleven or more employees where the employees are segregated on different shifts or in widely dispersed locations in crews of ten or less employees, may elect to have foreman-crew meetings in lieu of a safety and health committee plan provided:

(a) Foreman-crew safety meetings be held at least once a month, however, if conditions require, weekly or semimonthly meetings shall be held to discuss safety problems as they arise.

(b) All items under subsection (5) of this section shall be covered.

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-530, filed 8/27/81.]

**WAC 296-78-535 Safety bulletin board.** There shall be installed and maintained in every fixed establishment, a safety bulletin board sufficient in size to display and post safety bulletins, newsletters, posters, accident statistics and other safety educational material. It is recommended that safety bulletin boards be painted green and white.

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-535, filed 8/27/81.]

**WAC 296-78-540 First-aid training and certification.** The purpose of this section is to assure that all employees of this state can be afforded quick, and effective first-aid attention in the event that an injury occurs on the job. The means of achieving this purpose is to assure the presence of personnel trained in first-aid procedures at or near those places where employees are working. Compliance with the provisions of this section may require the presence of more than one first-aid trained person.

(1) In addition to RCW 51.36.030, every employer shall comply with the department's requirements for first-aid training and certification.

(2) There shall be present or available at all times, a person or persons holding a valid certificate of first-aid training. (A valid first-aid certificate is one which is less than three years old.)

(3) Compliance with the requirements of subsection (2) of this section may be achieved as follows:

(a) All foremen, supervisors, or persons in direct charge of crews working in physically dispersed operations, shall have a valid first-aid certificate: *Provided*, That if the duties or work of the foreman, supervisor or person in direct charge of a crew, is absent from the crew, another person holding a valid first-aid certificate shall be present. For the purpose of this section, a crew shall mean a group of two or more employees working at a work site separate and remote from the main office or fixed work place (such as occurs in construction, logging, etc.). In emergencies, foremen will be permitted to work up to thirty days without having the required certificate, providing an employee in the crew or another foreman in the immediate work area has the necessary certificate.

(b) In fixed establishments, all foremen, supervisors, or persons in direct charge if a group or groups of employees shall have a valid first-aid certificate: *Provided*, That in fixed establishments where the foreman, supervisor, or person in charge has duties which require his absence from the work site of the group, another person holding a valid first-aid certificate shall be present or available to the groups. Foremen, supervisors or persons

in direct charge of a group or groups of employees will be permitted to work up to thirty days without having the required certificate, providing an employee in the crew or another foreman in the immediate work area has the necessary certificate.

(c) In fixed establishments organized into distinct departments or equivalent organizational units such as department stores, large company offices, etc., a person or persons holding a valid first-aid certificate shall be present or available at all times employees are working within that department or organizational unit.

(d) In small businesses, offices or similar types of fixed workplaces, compliance may be achieved by having a number of such small businesses, offices, etc., combined into a single unit for the purpose of assuring the continued presence or availability of a person or persons holding a valid first-aid training certificate. A plan for combining a number of small businesses, etc., into such a group shall be submitted to the division of industrial safety and health, safety education section, for approval. That section is also available to assist employers who wish to develop such a plan. Criteria for approval by the division shall include:

(i) The businesses within the group must not be widely dispersed;

(ii) The name(s) of the person or persons holding the first-aid certificate, their usual places of work, their work phone numbers, and other appropriate information shall be posted in each establishment which is a member of the group, in a place which can reasonably be expected to give notice to employees of that establishment;

(iii) First-aid kits shall be available and maintained as required by WAC 296-24-065.

(e) Valid certification shall be achieved by passing a course of first-aid instruction and participation in practical application of the following subject matter:

Bleeding control and bandaging.

Practical methods of artificial respiration including mouth to mouth to nose resuscitation.

Closed chest heart massage.

Poisons.

Shock, unconsciousness, stroke.

Burns, scalds.

Sunstroke, heat exhaustion.

Frostbite, freezing, hypothermia.

Strains, sprains, hernias.

Fractures, dislocations.

Proper transportation of the injured.

Bites, stings.

Subjects covering specific health hazards likely to be encountered by co-workers of first-aid students enrolled in the course.

(4) Industrial first-aid course instructors will, upon request, be furnished by the division of industrial safety and health, department of labor and industries, either directly or through a program with the community colleges or vocational education.

(5) Employers of employees working in fixed establishments, meeting the following criteria, are exempt from the requirements of this section: *Provided*

(a) They can submit written evidence to the department upon request, that the worksite of their employees is within a two minute time frame of response by an aid car, medic unit or established ambulance service with first-aid trained attendants.

(b) There is a back-up aid car, medic unit or established ambulance service within the two minute response time; or that a first-aid trained person with readily available transportation is on the site of the posted emergency phone number for immediate dispatch in the event the primary unit is not available.

(c) There are no traffic impediments, such as draw bridges, railroad tracks, etc., along the normal route of travel of the aid car, medic unit or established ambulance service that would delay arrival beyond the required two minute time frame.

(d) Emergency telephone numbers are posted on all first-aid kits and at all telephones on the worksite.

(e) The above services are available or exist at all times when more than one employee is on the worksite.

Note: A construction site that will be of more than six months duration, such as a large building, shall be considered a fixed establishment for the purposes of this section. Doctor's offices and clinics are not to be considered as alternates due to the fact that very often doctor's schedules require them to be away from their offices.

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-540, filed 8/27/81.]

**WAC 296-78-545 First-aid kit.** (1) All employers who employ men and women covered by the Industrial Safety and Health Act shall furnish first-aid kits as required by the division of industrial safety and health, department of labor and industries, (RCW 51.36.030).

(2) First-aid supplies shall be readily accessible when required.

(3) In the absence of readily accessible first-aid supplies such as first-aid kits, first-aid stations, first-aid rooms or their equivalent, all crew trucks, power shovels, cranes, locomotives, loaders, dozers, logging trucks, speeders, freight trucks and similar equipment shall be equipped with not less than a ten package first-aid kit.

(4) All crew vehicles used for transporting workers shall be equipped with not less than a ten package first-aid kit. When more than five employees are being transported on any one trip, the kit shall be increased in size to comply with a 16, 24, or 36 package kit depending upon the number of personnel normally being transported.

(5) At least one first-aid kit shall be available on construction jobs, line crews, and other transient or short duration jobs. The size and quantity of first-aid kits, required to be located at any site, shall be determined by the number of personnel normally dependent upon each kit as outlined in the following table:

NUMBER OF PERSONNEL NORMALLY ASSIGNED TO WORKSITE	MINIMUM FIRST-AID SUPPLIES REQUIRED AT WORKSITE
1 - 50 persons	First-Aid Kit
1 - 5	10 package kit
6 - 15	16 package kit

NUMBER OF PERSONNEL NORMALLY ASSIGNED TO WORKSITE	MINIMUM FIRST-AID SUPPLIES REQUIRED AT WORKSITE
16 - 30	24 package kit
31 - 50	36 package kit
51 - 200 persons	First-Aid Station
51 - 75	One 36 and one 10 package kit
76 - 100	One 36 and one 16 package kit
101 - 150	One 36 and one 24 package kit
151 - 200	Two 36 package kits
Over 200 persons	First-Aid Room Refer to WAC 296-24-070

(6) Employers shall establish a procedure to assure that first-aid kits and required contents are maintained in a serviceable condition.

(7) First-aid kits shall contain at least the following items:

#### 10 Package Kit

- 1 Pkg. adhesive bandages, 1" (16 per pkg.)
- 1 Pkg. bandage compress, 4" (1 per pkg.)
- 1 Pkg. scissors\* and tweezers (1 each per pkg.)
- 1 Pkg. triangular bandage, 40" (1 per pkg.)
- 1 Pkg. antiseptic soap or pads (3 per pkg.)
- 5 Pkgs. of consulting physician's choice\*\*

#### 16 Package Kit

- 1 Pkg. absorbent gauze, 24" x 72" (1 per pkg.)
- 1 Pkg. adhesive bandages, 1" (16 per pkg.)
- 2 Pkgs. bandage compresses, 4" (1 per pkg.)
- 1 Pkg. eye dressing (1 per pkg.)
- 1 Pkg. scissors\* and tweezers (1 each per pkg.)
- 2 Pkgs. triangular bandages, 40" (1 per pkg.)
- 1 Pkg. antiseptic soap or pads (3 per pkg.)
- 7 Pkgs. of consulting physician's choice\*\*

#### 24 Package Kit

- 2 Pkgs. absorbent gauze, 24" x 72" (1 per pkg.)
- 2 Pkgs. adhesive bandages, 1" (16 per pkg.)
- 2 Pkgs. bandage compresses, 4" (1 per pkg.)
- 1 Pkg. eye dressing (1 per pkg.)
- 1 Pkg. scissors\* and tweezers (1 each per pkg.)
- 6 Pkgs. triangular bandages (1 per pkg.)
- 1 Pkg. antiseptic soap or pads (3 per pkg.)
- 9 Pkgs. of consulting physician's choice\*\*

#### 36 Package Kit

- 4 Pkgs. absorbent gauze, 24" x 72" (1 per pkg.)
- 2 Pkgs. adhesive bandages, 1" (16 per pkg.)
- 5 Pkgs. bandage compresses, 4" (1 per pkg.)
- 2 Pkgs. eye dressing (1 per pkg.)
- 1 Pkg. scissors\* and tweezers (1 each per pkg.)
- 8 Pkgs. triangular bandages, 40" (1 per pkg.)
- 1 Pkg. antiseptic soap or pads (3 per pkg.)
- 13 Pkgs. of consulting physician's choice\*\*

\*Scissors shall be capable of cutting 2 layers of 15 oz. cotton cloth or its equivalent.

\*\*First-aid kits shall be maintained at the ten, sixteen, twenty-four or thirty-six package level. In the event the consulting physician chooses not to recommend items, the department of labor and industries shall be contacted for recommended items to complete the kit.

(8) Where the eyes or body of any person may be exposed to injurious chemicals and/or materials, suitable facilities for quick drenching or flushing of the eyes and body shall be provided, within the work area, for immediate emergency use.

(9) When practical, a poster shall be fastened and maintained either on or in the cover of each first-aid kit and at or near all phones plainly stating, the phone numbers of available doctors, hospitals, and ambulance services within the district of the worksite.

(10) When required by the department, in addition to the first-aid kit which must be kept on the equipment or at the place of work, there shall be available within the closest practicable distance from the operations (not to exceed one-half mile) the following items:

- 1 set of arm and leg splints.
- 2 all wool blankets or blankets equal in strength and fire resistant (properly protected and marked).
- 1 stretcher.

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-545, filed 8/27/81.]

**WAC 296-78-550 First-aid station.** (1) First-aid stations shall be located as close as practicable to the highest concentration of personnel.

(2) First-aid stations shall be well marked and available to personnel during all working hours.

(3) One person holding a valid first-aid certificate shall be responsible for the proper use and maintenance of the first-aid station.

(4) First-aid stations shall be equipped with a minimum of two first-aid kits, the size of which shall be dependent upon the number of personnel normally employed at the worksite. One first-aid kit may be a permanent wall-mounted kit, but in all cases the station shall be equipped with at least one portable first-aid kit.

(5) When required by the department, the station shall be equipped with two wool blankets and a stretcher in addition to first-aid kits.

(6) A roster, denoting the telephone numbers and addresses of doctors, hospitals and ambulance services available to the worksite, shall be posted at each first-aid station.

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-550, filed 8/27/81.]

**WAC 296-78-555 First-aid room.** (1) Every fixed establishment employing more than two hundred persons shall have a first-aid room plainly designated as such, located as close as possible to the heaviest concentrated work area.

(2) The first-aid room shall be well lighted and ventilated, kept clean and orderly, provided with hot and cold running water, and maintained in a fully-equipped condition.

(3) The first-aid room shall be manned and maintained by:

- (a) A licensed physician; or
- (b) A licensed or registered nurse; or
- (c) An employee who:
  - (i) Holds a valid advanced first-aid certificate as recognized by the department,
  - (ii) works in the vicinity of the first-aid room, and



(iii) does not perform other work of the nature that is likely to affect adversely her/his ability to administer first-aid.

(4) First-aid rooms shall be equipped with items recommended by the consulting physician or plant medical officer and, as a minimum, should contain an adequate supply of the following:

- Antiseptic soap
- 3/4" or 1" adhesive compresses
- Adhesive knuckle bands
- 2" bandage compresses
- 4" bandage compresses
- 3" x 3" gauze pads
- Assorted sizes of large gauze pads
- 2" roller bandages
- 3" roller bandages
- 4" roller bandages
- Assorted adhesive tape rolls
- Eye dressings
- Ammonia inhalants
- Burn ointment
- Triangular bandages
- Scissors, forceps, razor and blades, medicine droppers
- Safety pins
- Drinking cups
- Rubbing alcohol
- Absorbent cotton
- Arm and leg splints
- Antidotes for specific industrial poisons
- Pressure points chart
- Stretcher
- Wool blankets and clean linen
- Hot water bottles
- Quick colds or ice bag
- Emergency first-aid kit
- A method of sterilizing instruments

(5) A poster shall be maintained on, or in the cover of, each first-aid cabinet and near each first-aid room phone. Such poster will state phone numbers of available doctors, hospitals, and ambulance services within the employer's district.

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-555, filed 8/27/81.]

**WAC 296-78-560 Safe place standards.** (1) Each employer shall furnish to each of his employees a place of employment free from recognized hazards that are causing or likely to cause serious injury or death to his employees.

(2) Every employer shall furnish and use safety devices and safeguards, and shall adopt and use practices, means, methods, operations, and processes which are reasonably adequate to render such employment and place of employment safe. Every employer shall do every other thing reasonably necessary to protect the life and safety of employees.

(3) No employer shall require any employee to go or be in any employment or place of employment which is not safe.

(4) No employer shall fail or neglect:

(a) To provide and use safety devices and safeguards.

(b) To adopt and use methods and processes reasonably adequate to render the employment and place of employment safe.

(c) To do every other thing reasonably necessary to protect the life and safety of employees.

(5) No employer, owner, or lessee of any real property shall construct or cause to be constructed any place of employment that is not safe.

(6) No person shall do any of the following:

(a) Remove, displace, damage, destroy or carry off any safety device, safeguard, notice, or warning, furnished for use in any employment or place of employment.

(b) Interfere in any way with the use thereof by any other person.

(c) Interfere with the use of any method or process adopted for the protection of any employee, including himself, in such employment, or place of employment.

(d) Fail or neglect to do every other thing reasonably necessary to protect the life and safety of employees.

(e) Intoxicating beverages and narcotics shall not be permitted or used in or around work sites. Workers under the influence of alcohol or narcotics shall not be permitted on the work site. This rule does not apply to persons taking prescription drugs and or narcotics as directed by a physician providing such use shall not endanger the worker or others.

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-560, filed 8/27/81.]

**WAC 296-78-565 Log dumps and ponds—Head-mills.**

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-565, filed 8/27/81.]

**WAC 296-78-56501 Log dumps and ponds.** (1) Log dumps, booms, ponds or storage areas, if used at night, shall be illuminated in accordance with the requirements of WAC 296-62-09003, general occupational health standards.

(2) A log dump shall be constructed at each log pond or decking ground. Log trucks shall not be unloaded by use of peavies or by hand.

(a) The roadbed shall be of hard packed gravel, heavy planking or equivalent material and shall be maintained at all times. Roadbeds at log dumps shall be of width and evenness to insure safe operation of equipment.

(b) A mechanical unloading device shall be provided and used for unloading logs. Log unloading areas shall be arranged and maintained to provide a safe working area.

(c) Signs prohibiting unauthorized foot or vehicle traffic in log unloading and storage areas shall be posted.

(d) At no time shall one person be permitted to work alone on a log dump, a booming or rafting grounds, or a log pond.

(3) Water log dumps. Ungrounded electrically powered hoists using handheld remote control in grounded



locations, such as log dumps or mill log lifts, shall be actuated by circuits operating at less than 50 volts to ground.

(4)(a) A brow log, skid timbers or the equivalent shall be installed on all log dumps.

(b) Where logs are unloaded onto skids, sufficient space shall be provided between the top of the skids and the ground to accommodate the body of a person.

(c) All truck dumps shall be built with not more than six inches variation of level from side to side.

(5)(a) All truck log dumps shall be equipped with a positive safeguard to prevent logs from leaving the load on the side opposite the brow log. Jill pokes shall not be used on truck log dumps.

(b) Unloading lines shall be attached and tightened or other positive safeguard in place before binder chains are released at any log dump.

(c) Stakes and chocks which trip shall be constructed in such manner that the tripping mechanism that releases the stake or chocks is activated at the opposite side of the load being tripped.

(d) Binders shall be released only from the side on which the unloader operates, except when released by remote control devices or except when person making release is protected by racks or stanchions or other equivalent means.

(e) Loads on which a binder is fouled by the unloading machine shall have an extra binder or metal band of equal strength placed around the load, or the load shall be otherwise secured so that the fouled binder can be safely removed.

(f) Unloading lines, crotch lines, or equally effective means shall be arranged and used in a manner to minimize the possibility of any log swinging or rolling back.

(6)(a) In unloading operations, the operator of unloading machine shall have an unobstructed view of the vehicle and the logs being unloaded.

(b) Unloading lines shall be arranged so that it is not necessary for the employees to attach them from the pond or dump site of the load except when entire loads are lifted from the log-transporting vehicle.

(7) All log dumps shall be kept reasonably free of bark and other debris.

(8) Employees shall remain in the clear until all moving equipment has come to a complete stop.

(9) Artificial log ponds subject to unhealthy stagnation shall be drained, cleansed, and water changed at least once every six months.

(10) All employees whose regular work requires walking on logs shall wear spiked or calked shoes, except when working in snow.

(11) Employees working on, over or along water, where the danger of drowning exists, shall be provided with and shall wear approved personal flotation devices.

(a) Employees are not considered exposed to the danger of drowning:

(i) When working behind standard height and strength guardrails;

(ii) When working inside operating cabs or stations which eliminate the possibility of accidentally falling into the water;

(iii) When wearing approved safety belts with lifeline attached so as to preclude the possibility of falling into the water;

(iv) When water depth is known to be chest-deep or less.

(b) Prior to and after each use, personal floating devices shall be inspected for defects which would reduce their designed effectiveness. Defective personal flotation devices shall not be used.

(c) To meet the approved criteria required by this subsection (11), a personal flotation device shall be approved by the United States Coast Guard as a Type I PFD, Type II PFD, Type III PFD, or Type V PFD, or their equivalent, pursuant to 46 CFR 160 (Coast Guard lifesaving equipment specifications) and 33 CFR 175.23 (Coast Guard table of devices equivalent to personal flotation devices). Ski belt or inflatable type personal flotation devices are specifically prohibited.

(12)(a) Wooden pike poles shall be of continuous, straight grained No. 1 material. Defective poles, blunt or dull pikes shall not be used.

(b) Aluminum or other metal poles shall not be used where hazard of coming in contact with live electric wires exists.

(13)(a) Walkways and floats shall be provided and security anchored to provide safe passage for workers.

(b) Permanent cable swifters shall be so arranged that it will not be necessary to roll boom sticks in order to attach or detach them.

(c) Inspection of cable or dogging lines shall be made as necessary to determine when repair or removal from service is necessary.

(14)(a) Decks of floats or other walkways shall be kept above the waterline at all times and shall be capable of supporting four times the load to be imposed.

(b) Floating donkeys or other power-driven machinery used on booms shall be placed on a raft or float with enough buoyancy to keep the deck above water.

(15)(a) All regular boom sticks and foot logs shall be reasonably straight, have all protruding knots and bark removed, and shall be capable of supporting above the waterline at either end, any necessary weight of workers and equipment.

(b) Stiff booms shall be two float logs wide secured by boom chains or other connecting devices, and of a width adequate for the working needs. Walking surfaces shall be free of loose material and maintained in good repair.

(c) Boom sticks shall be fastened together with cross-ties or couplings.

[Statutory Authority: Chapter 49.17 RCW. 89-11-035 (Order 89-03), § 296-78-56501, filed 5/15/89, effective 6/30/89. Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-56501, filed 8/27/81.]

**WAC 296-78-56503 Log hauls.** (1) Every log haul used as a walkway shall have at least one walkway with standard railing to enable workers to stand clear of the logs in the chute. Cleats shall be installed to provide safe footing on sloping walkways.

(2) Workers shall not stand under or dangerously near to logs that are being hoisted vertically to the log deck.

(3)(a) Log haul gears and bull chain drive mechanism shall be adequately guarded for the protection of employees.

(b) Log haul bull chains or cable shall be designed, installed, and maintained to provide a 4 to 1 safety factor for the intended load.

(c) Troughs for the return strand of log haul chains shall be provided over passageways.

(d) Overhead protection shall be provided for employees working below logs being moved to the log deck.

(4) Log haul controls shall be arranged to operate from a position where the operator will at all times be in the clear of logs, machinery lines and rigging. Such controls shall operate mechanism only when moved toward the log slip or deck.

(5) Where possible an automatic stop shall be installed on all log hauls. A positive stop shall be installed on all log hauls to prevent logs from traveling too far ahead in the mill.

(6)(a) Slip persons shall handle pike poles in such manner as to be in the clear in case of a slip back.

(b) All sorting gaps shall have a stiff boom on each side.

(c) The banks of the log pond in the vicinity of the log haul shall be reinforced to prevent caving in.

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-56503, filed 8/27/81.]

**WAC 296-78-56505 Boats and mechanical devices on waters.** (1) Prior to starting the boat motor, any spilled fuel shall be removed and vapors shall be exhausted from any area in which they may accumulate.

(2) The bilge area shall be kept clean and oil, grease, fuel, or highly combustible materials shall not be allowed to accumulate.

(3) Adequate ventilation equipment shall be provided and used for the bilge area to prevent the accumulation of toxic or explosive gases or vapors.

(4) Adequate ventilation equipment shall be provided and used for the cabin area on enclosed cabin-type boats to prevent an accumulation of harmful gases or vapors.

(5) Deck and cabin lighting shall be provided and used where necessary to provide safe levels of illumination aboard boats. Boats operated during the period from sunset to sunrise, or in conditions of restricted visibility, shall display navigation lights as required by the United States Coast Guard. Searchlights or floodlights shall be provided to facilitate safe navigation and to illuminate working or boarding areas adjacent to the craft.

(6) On craft used by workers wearing calked shoes, all areas where the operator or workers must stand or walk shall be made of or be covered with wood or other suitable matting or nonslip material and such covering shall be maintained in good condition.

(7) Each boat shall be provided with a fire extinguisher and life ring with at least fifty feet of one-fourth inch line attached. On log broncs, boom-scooters, or other small boomboats where all occupants are required to wear life saving devices and a life ring would present a tripping hazard, the life ring may be omitted.

(8)(a) Along docks, walkways, or other fixed installations on or adjacent to open water more than five feet deep, approved life rings with at least ninety feet of one-fourth inch line attached, shall be provided. The life rings shall be spaced at intervals not to exceed two hundred feet and shall be kept in easily visible and readily accessible locations.

(b) When employees are assigned work at other casual locations where exposure to drowning exists, at least one approved life ring with at least ninety feet of line attached, shall be provided in the immediate vicinity of the work assigned.

(c) When work is assigned over water where the vertical drop from the accidental fall would exceed fifty feet, special arrangements shall be made with and approved by the department of labor and industries prior to such assignment.

(d) Lines attached to life rings on fixed locations shall be at least ninety feet in length, at least one-fourth inch in diameter, and have a minimum breaking strength of five hundred pounds. Similar lines attached to life rings on boats shall be at least fifty feet in length.

(e) Life rings must be United States Coast Guard approved thirty-inch size.

(f) Life rings and attached lines shall be maintained to retain at least seventy-five percent of their designed buoyancy and strength.

(g) Log broncs, boomscooters, and boomboats shall not be loaded with personnel or equipment so as to adversely affect their stability or seaworthiness.

(h) Boats shall not be operated at an excessive speed or handled recklessly.

(i) Boat fuel shall be transported and stored in approved containers. Refer to WAC 296-24-58501(19) for definition of approved.

[Statutory Authority: Chapter 49.17 RCW. 88-23-054 (Order 88-25), § 296-78-56505, filed 11/14/88. Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-56505, filed 8/27/81.]

**WAC 296-78-56507 Log decks.** (1) Dry deck storage. (a) Dry deck storage areas shall be kept orderly and shall be maintained in a condition which is conducive to safe operation of mobile equipment.

(b) Logs shall be stored in stabilized piles, and roadways and traffic lanes shall be maintained at a width adequate for safe travel of log handling equipment.

(c) Logs shall be arranged to minimize the chance of accidentally rolling from the deck.

(2)(a) Employees shall not spool cable on winch or drums with their hands.

(b) Log wells shall be provided with safeguard to prevent logs from rolling back into well off log deck.

(3) Jump skids on log decks shall be installed in grooves in a manner that they cannot work out onto the carriage way.

(4)(a) Log decks shall be provided with effective means to prevent logs from accidentally rolling down the deck onto the carriage or its runway.

(b) Swing saws. Swing saws on log decks shall be equipped with a barricade and stops for protection of

employees who may be on the opposite side of the log haul chute.

(c) Drag saws. Where reciprocating log cutoff saws (drag saws) are provided, they shall not project into walkway or aisle.

(d) Circular cutoff saws. Circular log bucking or cut-off saws shall be so located and guarded as to allow safe entrance to and exit from the building.

(e) Entrance doorway. Where the cutoff saw partially blocks the entrance from the log haul runway the entrance shall be guarded.

(5) A barricade or other positive stop shall be erected between the sawyer's stand and the log deck to protect the sawyer from rolling logs. Such barricade or stop shall be of sufficient strength to stop any log.

(6) Chains from overhead canting gear or other equipment shall not be allowed to hang over the log deck in such manner as to endanger workers.

(7) Canting gear control levers shall be so arranged that they move away from the carriage to operate.

(8) Moving parts or equipment on or about log decks shall be guarded.

(9) Peavies, canthooks and other hand tools shall be kept in good repair at all times.

(10) Workers shall not go below logs on decks that are likely to roll or be rolled. Means of access shall be provided to the head rig which does not subject employees to the hazard of moving logs or equipment.

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-56507, filed 8/27/81.]

**WAC 296-78-56509 Mechanical barkers.** (1) Rotary barkers. Rotary barking devices shall be so guarded as to protect employees from flying chips, bark, or other extraneous material.

(2) Elevating ramp. If an elevating ramp or gate is used, it shall be provided with a safety chain, hook, or other means of suspension while employees are underneath.

(3) Area around barkers. The hazardous area around ring barkers and their conveyors shall be fenced off or posted as a prohibited area for unauthorized persons.

(4) Enclosing hydraulic barkers. Hydraulic barkers shall be enclosed with strong baffles at the inlet and outlet. The operator shall be protected by adequate safety glass or equivalent.

(5) Holddown rolls. Holddown rolls shall be installed at the infeed and outfeed sections of mechanical ring barkers to control the movement of logs.

(6) If such holddown rolls have a tendency to throw logs or chunks, horseshoe or equivalent type guards shall be installed to contain the logs or chunks.

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-56509, filed 8/27/81.]

**WAC 296-78-56511 Head rigs and feed works.** (1) A clear walkway shall be provided along the upper side of the log deck and around the head rig unless an overhead walkway is provided.

(2) The sawyer shall be primarily responsible for the safety of the carriage crew and off-bearers. He shall exercise due care in the operation of the carriage and log turning devices.

(3) Feedworks and log turning control levers shall be so arranged that they may be securely locked when not in use and shall be guarded against accidental contact.

(4)(a) A positive means shall be provided to prevent unintended movement of the carriage. This shall involve a control locking device, a carriage tie-down, or both.

(b) An emergency control or equally effective means shall be provided so that the sawyer may stop the head rig section of the mill without leaving the operator station.

(5) An effective method of disengaging the head rig saws from the power unit shall be installed on all head rigs where the power unit is not directly controlled by the sawyer. The saws shall be disengaged from the source of power while repairs or changes are made.

(6) A shield of lexan, makrolon, merlon, plestar, or equivalent transparent material, shall be installed between the sawyer's stand and the head saws in all circular mills. In band mills and chipper type installations, a wire screen of not less than twelve gauge wire, one-half inch mesh, mounted in a frame in compliance with the requirements of WAC 296-24-20531 of the general safety and health standards, is an acceptable substitute for the type shield required in circular mills.

(7) Safety glasses, safety shields or other suitable eye protection shall be provided for and use by head rig off-bearers.

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-56511, filed 8/27/81.]

**WAC 296-78-56513 Log carriages.** (1) Carriages upon which employees are required to work shall be solidly decked over.

(2) Dogs. Dogging devices shall be adequate to secure logs, cants, or boards, during sawing operations.

(3) The feed control lever of friction or belt driven carriage feed works shall be arranged to operate away from the saws or carriage track.

(4) A quick action valve, controlled from the sawyer's stand, shall be located in the steam line to any steam operated feed works. The valve shall be tested daily.

(5) Valves in steam feeds shall be closed and locked in a neutral position before the sawyer leaves his station. Leaking steam valves or piping shall not be used on carriage drives.

(6)(a) Where employees ride the headrig carriage, clearance of the rear edge of the carriage shall be either not more than two inches or shall be not less than thirty inches from the side wall of the building. The side wall shall be boarded over smoothly to height of not less than six feet six inches from the setter's platform and for at least the length of the carriage travel. Where the clearance is thirty inches or more the floor between the back side of the setter's platform and the wall shall be raised to the level of the platform. The clearance between the floor edge and the platform shall not be more than two inches.

(b) Barriers and warning signs. A barrier shall be provided to prevent employees from entering the space necessary for travel of the carriage, with headblocks fully retracted, for the full length and extreme ends of carriage runways. Warning signs shall be posted at possible entry points to this area.

(7) Safe access to the head rig shall be provided.

(8) No roof truss or roof timber or other obstruction shall be located within six feet six inches of the upper surface of the setter's platform on any carriage.

(9) Doors which lead onto a passageway at the end or side of the carriage runway shall be provided with a handrail opposite such doorway. Handrail shall not be less than eighteen inches from the carriage run. A warning sign shall be posted on the entrance side of such doorways.

(10) A stop or bumper capable of stopping the loaded carriage at operating speed shall be installed at each end of the carriage run.

(11) Rail sweeps shall be installed in front of the front wheels in the direction of travel. Such sweeps shall extend to within one-fourth inch of the rail.

(12) Where power operated log turners are used, carriage knees shall be provided with goosenecks or other means of protecting the carriage crew from climbing logs.

(13) Employees shall use a stick or wire brush to clear head blocks of debris.

(14) All weakened or broken carriage boards which will not support the load to be imposed with a safety factor of 4, shall be immediately replaced.

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-56513, filed 8/27/81.]

**WAC 296-78-570 Band saws--Saws.** (1) Band head rigs shall be given a thorough daily inspection and any deficiency reported and corrected.

(2) Any band saw found to have developed a crack greater than one-tenth the width of the saw shall be removed from service until the width of the saw is reduced to eliminate the crack, the cracked section is removed, or the development of the crack is arrested by welding.

(3) Band saws shall not be continued in use of the head rig for which they have been designed after they have been reduced forty percent in width.

(4) Leather gloves, or equivalent hand protection, shall be worn by employees while changing band saws.

(5) All head band saw wheels shall have a minimum rim thickness of five-eighths inch, except for a distance of not to exceed one inch from the front edge of the wheel.

(6) Provisions shall be made for alerting and warning employees before starting band head saws, and measures shall be taken to insure that all persons are in the clear.

(7) No band saw shall be run at a peripheral speed in excess of that recommended by the manufacturer. The manufacturer's recommended maximum speed shall be stamped in plainly legible figures on some portion of the assembly.

(8) A band wheel that has developed a crack in the rim shall be immediately removed from service. If a

crack has developed in a spoke the wheel shall be removed from service until repaired.

(9) All band wheels shall be completely encased or guarded on both sides. The exposed part of the saw blade on the uptravel between the two wheels shall be encased, and no portion of the blade exposed, except such part of the cutting edge as is essential for sawing the material at hand.

(10) All band wheel guards shall be constructed of not less than ten U.S. gauge metal, or not less than two inch wood material or equivalent, attached to the frames. Ventilating ports shall not exceed 2 x 4 inches in size. Openings necessary for lubrication or repair of the saw shall have doors or gates of equivalent strength to the remainder of the guard.

(11) Every band mill shall be equipped with a saw catcher, rest or guard of substantial construction.

(12) All band saws other than head mills shall be enclosed or guarded except the working side of the blade between the guide and the table. The guard for the portion of the saw between the sliding guide and the upper saw wheel guard shall be adjusted with the guide.

(13) Each gang ripper of band or straight saw type shall have the cutting edges of the saw guarded by a hood or screen secured to the framework of the machine.

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-570, filed 8/27/81.]

**WAC 296-78-575 Circular saws.** (1) Single circular head saws. Circular head saws shall not be operated at speeds in excess of those specified by the manufacturer. Maximum speed shall be etched on the saw.

(2) On all circular saw mills the horizontal distance from the side of the saw to the nearest post of the husk or frame shall be at least one inch greater than the clear vertical distance between the collars of the top and bottom saws.

(3) Circular head saws shall be equipped with safety guides that can be readily adjusted without use of wrench or other hand tools. Brackets or edging supports shall be installed between the saw and the side of the husk.

(4) The upper saw of a double circular mill shall be provided with a hood or guard. A screen or other suitable device shall be placed so as to protect the sawyer from flying particles.

(5) All circular sawmills where live rolls are not used behind the head saw shall be equipped with an effective spreader or splitter. In any mill where the head saw is used for edging lumber, the splitter shall be solid and stationary and shall extend above the head blocks.

(6) Drag saws or circular cut-off saws shall be so arranged that they will not project into any passageway. When existing installations do not leave clear passage, saws shall be fenced off in order to make it impossible for anyone to walk into them. Means to securely hold material being sawed shall be provided wherever such material creates a hazard.

(7) All employees shall be in the clear before starting operation of drag or swing cut-off saws.

(8) Twin circular head saws. Twin circular head saw rigs such as scrag saws, shall meet the specifications for single circular head saws in subsection (1) of this section, where applicable.

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-575, filed 8/27/81.]

**WAC 296-78-580 Edgers.** (1) Edgers shall be guarded by a metal housing of ten gauge sheet metal, ten gauge by one-half inch mesh wire, screen, or by a baffle of not less than two inch wood material.

(2) Openings in end frames shall be enclosed with sheet metal, wire screen or wood and may be hinged or arranged to permit oiling and removal of saws.

(3) The top of the edger shall be guarded to prevent contact by employees or debris being thrown and all chains and gears fully enclosed as required by WAC 296-78-710 of this chapter.

(4) Vertical arbor edgers installed ahead of the main saw shall be so located and guarded that an employee cannot contact any part of the edger saws from his normal operating position.

(5) Edgers shall not be located in the main roll case behind the head saw.

(6) All edgers shall be equipped with pressure feed rolls. The controls shall be installed and located so that from the normal work station the operator can quickly stop the infeed drive without releasing the hold down tension of the pressure rolls.

(7) All edgers shall be provided with a method of preventing or guarding against kickbacks. Finger units or dogs installed at the edger, or hinged steel plates suspended across the feed table may be used for this purpose. A kickback barricade, in line with the edger, if fenced off may be used.

(8) Pressure and feed rolls on edgers shall be guarded against accidental contact by means of roll covers, bars or strips. The pressure rolls shall not be lifted while stock is being run, or while any person is in line with the feed side of the saws.

(9) Edger men shall not raise feed rolls and reach between saws while edger is in operation.

(10) Edger men shall not put hands on cants being run through the edger.

(11) Live rolls in back of edger shall operate at a speed not less than the speed of the edger feed rolls.

(12) Tables in back of edgers shall be kept clear of cants, edgings and unnecessary debris.

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-580, filed 8/27/81.]

**WAC 296-78-585 Equalizer saws.** (1) Equalizer saws for bolts, staves, heading, etc., shall have the saws encased, except that portion immediately adjacent to the feeding device.

(2) Feeding devices on all such equipment shall be provided with guards to prevent contact with the feeding device by employees.

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-585, filed 8/27/81.]

[Title 296 WAC—p 1682]

**WAC 296-78-590 Gang saws and re-saws.** (1) Gang saws and re-saws shall be fully guarded or housed in accordance with conditions. Cranks, pitman rods, and other moving parts shall be guarded.

(2) Feed rolls shall be enclosed by a cover over the top, front, and open ends except where guarded by location. Drive mechanism to feed rolls shall be enclosed.

(3) Feed rolls shall be enclosed and if the operator stands within thirty inches of the feed rolls, they shall be so guarded as to prevent operator coming into contact with them.

(4) Circular re-saws or rip saws, except power feed rip saws with a roller or wheel back of the saw, shall be provided with splitters or spreaders.

(5) A hood of metal or wood of sufficient strength to give protection against splinters or flying teeth shall be provided over all circular rip saws.

(6) That portion of the saw extending below the table shall be so guarded as to prevent contact.

(7) Circular rip saws shall be equipped with a standard anti-kickback device.

(8) Carriage cradles of whole-log sash gang saws, Swedish gangs shall be of height to prevent logs from kicking out while being loaded.

(9) Band re-saws. Band re-saws shall meet the specifications for band head saws as required in WAC 296-78-570(7).

(10) Circular gang re-saws.

(a) Banks of circular gang re-saws shall be guarded by a hood to contain teeth or debris which can be thrown by the saws.

(b) Circular gang re-saws shall be provided with safety fingers or other anti-kickback devices.

(c) Circular gang re-saws shall not be operated at speeds exceeding those recommended by the manufacturer.

(d) Feed belts and drive pulleys shall be guarded in accordance with the requirements of WAC 296-24-205 through 296-24-20533 of the general safety and health standard.

(e) Each circular gang re-saw, except self-feed saws with a live roll or wheel at back of saw, shall be provided with spreaders.

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-590, filed 8/27/81.]

**WAC 296-78-595 Jump saws.** (1) Jump saws shall have guards below the top of the table or roll case. A guard shall be placed over the roll casing to prevent persons from walking into or over the saw.

(2) Jump saws, underhung swing saws, or bed trimmers shall be so arranged that the saws are fully enclosed when not in actual use.

(3) A positive stop shall be installed to prevent the saw from passing the front edge of the roll case or table. The throat in the table or roll case shall be only wide enough to permit unobstructed operation of the saw.

(4) Guards constructed of not less than two inch wood material or of heavy wire mesh mounted in a steel frame shall be placed in front of jump saw trimmers. Stops

shall be installed to prevent timber from being thrown off the roll case.

(5) Foot treadle operated saws shall be provided with safeguards to prevent accidental contact.

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-595, filed 8/27/81.]

**WAC 296-78-600 Trimmer and slasher saws.** (1) Trimmer or slasher saws shall be guarded in front by a flat or round steel framework with a rigid metal screen or light iron bars attached thereto, or by wood baffles of not less than two inch wood material securely bolted to the frame.

Maximum speed. Trimmer saws shall not be run at peripheral speeds in excess of those recommended by the manufacturer.

(2) Front guards for a series of saws shall be set as close to the top of the feed table as is practical when considering the type of machine in use and the material being cut. The end saws of a series shall be guarded or fenced off.

(3) The rear of a series of saws shall have a stationary or swinging guard of not less than two inch wood material or equivalent the full width of the saws and as much wider as is necessary to protect persons at the rear of the trimmer.

(4) Safety stops. Automatic trimmer saws shall be provided with safety stops or hangers to prevent saws from dropping on table.

(5) Feed chains shall be stopped while employees are on the feed table.

(6) Spotters for trimmers or slashers shall be provided with goggles or other eye protection when conditions so warrant.

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-600, filed 8/27/81.]

**WAC 296-78-605 Swing saws.** (1) Overhead swing cut-off saws shall be guarded by a hood which shall cover the upper half of the cutting edge at least to the depth of the teeth.

(2) The driving belts on overhead swing cut-off saws, where exposed to contact, shall be provided with guards as required by WAC 296-78-030.

(3) Saws shall be completely enclosed when in idle position.

(4) Power operated swing saws shall have controls so arranged that the operators will not stand directly in front of saw when making cut.

(5) All swing saws shall be equipped with a counter balance which shall be permanently fastened to the frame of the saw and so arranged or adjusted that it will return the saw beyond the rear edge of the table or roll case without a rebounding motion. Wire rope, chain or nonmetallic rope running to a weight over a sheave shall not be used for attaching counter balance.

(6) No swing cut-off or trim saw shall be located directly in line with stock coming from an edger.

(7) Swing limit stops shall be provided and so adjusted that at no time shall the forward swing of the saw

extend the cutting edge of the saw beyond a line perpendicular with the edge of the saw table, roll case, guard or barrier.

(8) Saws that are fed into the cut by means of air, steam, hydraulic cylinders, or other power device or arrangement shall be designed so they can be locked or rendered inoperative.

(9) Foot treadle operated saws shall be provided with safeguards to prevent accidental contact.

(10) Swing saws on log decks shall be equipped with a positive stop for the protection of persons who may be on the opposite side of the log haul chute.

(11) Operators of hand operated swing saws shall not stand directly in front of saw while making cut.

(12) Tables or roll casings for swing saws shall be provided with stops or lineup rail to prevent material being pushed off on opposite side.

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-605, filed 8/27/81.]

**WAC 296-78-610 Circular saws, speeds, repairs.**

(1) Circular saws shall not be operated at speeds in excess of that specified by the manufacturer. Speeds shall be etched on all new saws. When saws are repaired, re-manufactured or retensioned in any way to change their operating speeds, such change of speed shall be etched on the saw. These etched speeds shall not be exceeded.

(2) Circular saws shall be inspected for cracks each time that the teeth are filed or set.

(3) A circular saw shall be discontinued from use until properly repaired when found to have developed a crack equal to the length indicated in the following table:

<u>Length of Crack</u>	<u>Diameter</u>
1/2 - inch . . . . .	Up to 12"
1 - inch . . . . .	Over 12" to 24"
1-1/2 - inch . . . . .	Over 24" to 36"
2 - inch . . . . .	Over 36" to 48"
2-1/2 - inch . . . . .	Over 48" to 60"
3 - inch . . . . .	Over 60"

(4) Welding or slotting of cracked saws shall be done by a sawsmith under a procedure recommended by the saw manufacturer. Holes shall not be drilled in saws as a means of arresting cracks. After saws are repaired they shall be retensioned. Unless a sawsmith is employed, saws shall be returned to the manufacturer for welding or tensioning.

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-610, filed 8/27/81.]

**WAC 296-78-615 Saw filing and grinding rooms and equipment.** (1) Approaches to filing rooms shall be kept free from material and equipment at all times.

(2) Enclosed grinding and filing rooms shall be ventilated as specified in the general occupational health standard, WAC 296-62-110 through 296-62-11019.

(3) Each filing and grinding room shall be provided with two exits so arranged as to permit easy escape in case of fire.



(4) Floor shall be cleaned regularly and shall be kept free from oil, grease and other materials that might cause employees to slip or fall.

(5) Flooring around machines shall be kept in good repair at all times.

(6) Saw grinding machine belts shall be provided with guards where these belts pass through the frame of the machine.

(7) All grinding wheels on such machines shall be provided with a metal retaining hood which shall also cover the arbor ends if they are exposed to contact.

(8) Filing room employees shall be provided with goggles, face shields, or other necessary protective equipment and are required to wear the same.

(9) Guarding and mounting of abrasive wheels shall be in accordance with WAC 296-24-18003 through 296-24-18007 of the general safety and health standards.

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-615, filed 8/27/81.]

**WAC 296-78-620 Miscellaneous woodworking machines—Planers, stickers, molders, matchers.** (1) Each planing, molding, sticking and matching machine shall have all cutting heads, and saws if used, covered by a solid metal guard.

(2) Planers, stickers, molding, sticking and matching machines shall be provided with exhaust fans, hoods and dust conveyors to remove the harmful dusts, etc., from the vicinity of the operator. Such hoods may be arranged to serve as guards for cutting heads.

(3) Planers and other machinery or equipment shall not be oiled while in motion, unless provided with guards or other devices to permit oiling without any possibility of contact with moving parts of machinery.

(4) Feed rolls shall be guarded by means of roll covers, bars or strips, attached to the roll frame in such manner as to remain in adjustment for any thickness of lumber.

(5)(a) Levers or controls shall be so arranged or guarded as to prevent accidental operation of machines.

(b) Foot treadle operated machines shall have a treadle guard fastened over the treadle.

(c) Locks, blocks, or other device shall be provided for positive immobilization of machine controls while repairs or adjustments are being made.

(6) Side head hoods shall be of sufficient height to safeguard the head set screw.

(7) Side heads shall not be adjusted while machine is in operation, except when extension adjusting devices are provided.

(8) Side belt and pulley guards shall be kept in place at all times the machine is in motion.

(9) All universal joints shall be enclosed.

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-620, filed 8/27/81.]

**WAC 296-78-625 Planers (stave and headings).** (1) Each planer (stave and heading) shall have all cutting heads, and saws if used, covered by a solid metal guard.

[Title 296 WAC—p 1684]

(2) Stave and heading planers shall be provided with exhaust fans, hoods and dust conveyors to remove the harmful dusts, etc., from the vicinity of the operator. Such hoods may be arranged to serve as guards for cutting heads.

(3) Sectional feed rolls should be provided. Where solid feed rolls are used, a sectional finger device (or other means equally effective) shall be provided to prevent kickbacks.

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-625, filed 8/27/81.]

**WAC 296-78-630 Stave croziers.** (1) Stave croziers shall have the heads guarded completely by the exhaust hood or other device, except that portion which actually inbeds itself in the stock.

(2) Each stave crozier shall have all feed chains and sprockets completely enclosed.

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-630, filed 8/27/81.]

**WAC 296-78-635 Jointers.** (1) Each hand feed jointer or buzz planer with horizontal head shall be provided with an automatic guard over the cutting head both in front of and in back of the guide.

(2) Each jointer or buzz planer with horizontal head shall be equipped with a cylindrical cutting head, the throat of which shall not exceed three-eighths inch in depth or one-half inch in width.

(3) Each jointer or buzz planer with vertical head shall be guarded by an exhaust hood or other approved device which shall completely enclose the revolving head except for a slot sufficiently wide to permit the application of material.

(4) Push sticks shall be provided and used for feeding stock through hand operated jointers or buzz planers.

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-635, filed 8/27/81.]

**WAC 296-78-640 Jointers (stave and heading).** (1) Stave and heading jointers and matchers shall have the heads guarded completely by the exhaust hood or other device, except that portion where the stock is applied.

(2) Foot power stave jointing machines shall have the knife effectively guarded to prevent the operator's fingers from coming in contact with it.

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-640, filed 8/27/81.]

**WAC 296-78-645 Wood shapers.** (1) The cutting head of each wood shaper, hand feed panel raiser, or other similar machine not automatically fed, shall be guarded with a cage or pulley guard or other device so designed as to keep the operator's hands away from the cutting edge. In no case shall a warning device of leather or other material attached to the spindle be acceptable. Cylindrical heads shall be used wherever the nature of the work permits. The diameter of circular shaper guards shall be not less than the greatest diameter of the cutter.



(2) All double spindle shapers shall be provided with a spindle starting and stopping device for each spindle or provision shall be made that only one spindle operate at any one time.

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-645, filed 8/27/81.]

**WAC 296-78-650 Boring and mortising machines.** Boring and mortising machines shall be provided with safety bit chucks without projecting set screws. Automatic machines shall be provided with point of operation guards. When necessary to prevent material from revolving with the bit, clamps or stops shall be provided and used to hold material firmly against the guides.

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-650, filed 8/27/81.]

**WAC 296-78-655 Tenoning machines.** (1) Each tenoning machine shall have all cutting heads, saws if used, and all exposed moving parts guarded. In the case of cutting heads and saws, the guard shall be of solid metal.

(2) If sheet metal is used, it shall be not less than ten U.S. gauge in thickness. If cast metal is used it shall be not less than three-sixteenths inch thick, or if aluminum is used, it shall be not less than five-eighths inch thick. The hood of the exhaust system may form part or all of the guard. When so used, the hood shall be constructed of metal of a thickness not less than that specified herein.

(3) Feed chains and sprockets of all double end tenoning machines shall be completely enclosed, except that portion of chain used for conveying stock. At rear ends of frames over which the feed conveyors run, sprockets and chains shall be guarded at the sides by plates projecting beyond the periphery of sprockets and ends of lugs.

(4) The rear end of the frame over which the feed conveyors run shall be so extended that the material as it leaves the machine will be guided to a point within easy reach of the person removing stock at the rear of the tenoner.

(5) Single end tenoners, hand fed, shall have a piece of sheet metal placed so that the operator's hands cannot slip off the lever handle into the tool in passing. Such guard shall be fastened to the lever.

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-655, filed 8/27/81.]

**WAC 296-78-660 Lathe (pail and barrel).** (1) Each profile, swing-head and back-knife lathe shall have all cutting heads covered by a solid metal guard.

(2) If sheet metal is used, it shall be not less than ten U.S. gauge in thickness. If cast metal is used, it shall be not less than three-sixteenths inch thick, or if aluminum is used, it shall be not less than five-eighths inch thick. The hood of the exhaust system may form part or all of the guard. When so used, the hood shall be constructed of metal of a thickness not less than that specified above.

(3) Pail and barrel lathes shall be guarded in accordance with the specifications for profile and back-knife lathes insofar as they are applicable.

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-660, filed 8/27/81.]

**WAC 296-78-665 Sanding machines.** (1) Each belt sanding machine shall have both pulleys enclosed in such a manner as to guard the points where the belt runs onto the pulleys. The edges of the unused run of belt shall be enclosed or otherwise guarded from contact by employees.

(2) Each drum sanding machine shall be provided with a guard so arranged as to completely enclose the revolving drum except such portion required for the application of the material to be finished. Guards with hinges to facilitate the insertion of sandpaper may be installed. The exhaust hood may form part or all of this guard. When so used, the hood shall conform to the specifications as given under exhaust systems in WAC 296-78-710.

(3) All standard stationary sanding machines shall be provided with exhaust systems in conformity with the section of this code dealing with exhaust systems.

(4) All portable sanding machines shall be provided with means of removing excessive dust, or employees using equipment shall be provided with such necessary respiratory protective equipment as will conform to the requirements of the general occupational health standards, chapter 296-62 WAC.

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-665, filed 8/27/81.]

**WAC 296-78-670 Glue machines.** (1) Personal protective equipment as required by the general safety and health standard, WAC 296-24-075 through 296-24-092, and the general occupational health standard, WAC 296-62-11021, and proper washing facilities with noncaustic soap and sterilizers, shall be provided for all employees handling glue. Rubber gloves and other personal equipment must be sterilized when transferred from one person to another.

(2) Glue spreaders shall be enclosed on the in-running side, leaving only sufficient space to insert the stock.

(3) All glue spreaders shall be equipped with a panic bar or equivalent type device that can be reached from either the infeed or outfeed side of the spreader to shut-off the power in an emergency situation. Such device shall be installed on existing glue spreaders no later than April 1, 1982, and be standard equipment on any glue spreader purchased after January 1, 1982.

(4) All glue mixing and handling rooms where located above work areas shall have water tight floors.

(5) All glue rooms shall be provided with ventilation in accordance with WAC 296-62-110 through 296-62-11013, of the general occupational health standard.

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-670, filed 8/27/81.]

**WAC 296-78-675 Lath mills.** (1) Lath mills shall be so arranged that stock pickers shall be protected from slabs and blocks from slasher and trimmers.

(2) Bolters and lath machines shall be provided with a wall or shield of not less than two inch wood material or equivalent, constructed in front of the machines, to protect stock pickers and passing employees from kickbacks.

(3) Lath bolters and lath mills shall have all feed rolls, belts, gears and moving parts provided with approved guards. Feed chains shall be guarded to as low a point as the maximum height of the stock will permit.

(4)(a) Lath bolters and lath mill saws shall be provided with a sheet metal guard not less than one-eighth inch thick, or a cast iron guard not less than three-sixteenths inch thick, or equivalent. These hoods may be hinged so that they can be turned back to permit changing of the saws.

(b) A metal plate baffle, finger device or other device, shall be installed to prevent kickbacks.

(5)(a) The feed rolls on bolters or lath mills shall not be raised while any employee is in line with the saws.

(b) The stock shall be pushed through the saws with another piece of stock or push stick.

(6)(a) The lath trimmer shall be provided with guards on the ends, the top and the rear so designed as to contain debris and prevent employee contact with the saw. The belt drive shall be provided with guards as required by WAC 296-78-710.

(b) The entire top half of all trimmer saws shall be provided with guards. The guards shall be so adjusted as to prevent employees from accidentally contacting saws.

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-675, filed 8/27/81.]

**WAC 296-78-680 Veneer and plywood plants--Peeling and barking.** (1) Where peeling or barking pits are located directly under the log cranes, logs shall not be moved over workers.

(2) Single spiked hooks without a bell shall not be used for handling logs. Hooks shall be equipped with hand holds and shall be maintained in condition to safely perform the job application.

(3) Mechanical barking devices shall be so guarded as to protect employees from flying chips, bark or other matter.

(4) Logs shall not be removed from barker until barking head has ceased to revolve, unless barker is so designed and arranged that barking head will not create or constitute a hazard to employees.

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-680, filed 8/27/81.]

**WAC 296-78-685 Veneer lathe.** (1) The elevating ramp (gate) shall be provided with a safety chain and hook or other positive means of suspension while employees are working underneath same.

(2) The area under the tipple from lathe to stock trays shall be provided with railings or other suitable means of preventing employees from entering this area, if access is not prevented by the construction of the machine and employees can enter this area.

[Title 296 WAC—p 1686]

(3) Catwalks shall be provided along stock trays so that employees will not have to climb on the sides of trays to straighten stock.

(4) Any section of stock trays shall be locked out or shall have an operator stationed at starting controls while stock is being removed or adjusted.

(5) Guards which will cover the cutting edge of veneer lathe and clipper blades shall be provided and used while such blades are being transported about premises.

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-685, filed 8/27/81.]

**WAC 296-78-690 Veneer slicer and cutter.** Each veneer slicer and each rotary veneer cutter shall have all revolving and other moving knives provided with guards.

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-690, filed 8/27/81.]

**WAC 296-78-695 Veneer clipper.** (1) Each veneer clipper shall have either automatic feed or shall be provided with a guard which will make it impossible to place any portion of the hand under the knife while feeding stock. Where practicable, such guard shall be of the vertical finger type.

(2) The rear of each manually operated clipper shall be guarded either by a screen or vertical finger guard which shall make it impossible for any portion of the hand to be placed under the knife while removing clipped stock.

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-695, filed 8/27/81.]

**WAC 296-78-700 Veneer wringer (swede).** The entry side of each veneer wringer other than glue spreader shall be enclosed, leaving only sufficient space to insert stock. A guard shall be provided to prevent the veneer from overriding the top roll and kicking back.

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-700, filed 8/27/81.]

**WAC 296-78-705 The shake and shingle industry.** The following terms and standards shall apply only in the manufacturing of shakes and shingles and these requirements shall take precedence over other sawmill and woodworking standards.

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-705, filed 8/27/81.]

**WAC 296-78-70501 Definitions--Terms, general.** (1) "Block(s)" – those sections of a log cut in various lengths.

(2) "Block(s)" and "bolt(s)" may be considered to be synonymous.

(3) "Clipper saw" – a circular saw used to trim manufactured shingles.

(4) "Groover" – a cylinder-type knife (knives) similar to a planer knife (knives), used to cut grooves into the face surface of shakes or shingles.

(5) "Hip" and "ridge saw" – a circular saw used to cut various angles on the side edge of shakes or shingles.

(1989 Ed.)

(6) "Johnson bar" – a shaft used to control the feed of the carriage.

(7) "Knee bolter circular saw" – a stationary circular saw used to trim and debark blocks (the blocks are manually maneuvered onto a carriage and fed into a saw).

(8) "Log haul" – a power conveyor used to move logs to mill.

(9) "Packers" – employees who pack the manufactured shakes or shingles into bundles.

(10) "Panagraph power splitter" – a hydraulically operated wedge, manually positioned into place, used to split blocks.

(11) "Power saw splitter" – a stationary circular saw used to split (saw) blocks, (the blocks are manually maneuvered onto a carriage and fed into the saw).

(12) "Set works" – a component of the shingle machine, located on the machine frame, used to control the thickness of each shingle being manufactured.

(13) "Shake machine" – a band saw used to cut shake blanks into manufactured shakes.

(14) "Shake splitter" – a stationary hydraulically operated wedge, manually controlled, used to split shake blocks into shake blanks or boards.

(15) "Shim saw" – a circular saw used to re-cut manufactured shingles into narrow widths.

(16) "Shingle machine" – a machine used to manufacture shingles; composed of a feed, set works, and carriage system, all functioning in relation to a circular saw.

(17) "Shingle saw" – a circular saw used to cut shingles from blocks.

(18) "Spault" – the first and last section(s) of a block as it is cut into shingles.

(19) "Spault catcher" – a device located on the shingle machine next to the solid feed rolls, used to hold the last section of each block being cut (called a spault), in place.

(20) "Track or swing cutoff saw" – a circular saw used to cut blocks from a log.

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-70501, filed 8/27/81.]

**WAC 296-78-70503 Shake and shingle machinery—General.** (1) Track or swing cutoff circular saw.

(a) A power operated track or swing cutoff circular saw shall have controls so arranged that operators are not positioned directly in front of the saw while making a cut.

(b) All track or swing cutoff circular saws shall be completely encased or guarded when the saw is in the retract position, except for that portion of the guard that must be left open for the operation of the saw.

(c) Track or swing cutoff circular saw guards shall be constructed of sheet metal not less than one-eighth inch thick, or a wood guard of not less than nominal two inch thick wood material, or equivalent.

Hinged or removable doors or gates will be permitted where necessary to permit adjusting and oiling.

(d) The driving belt(s) on the track or swing cutoff circular saw shall be guarded in accordance with the

general safety and health standard, WAC 296-24-205 through 296-24-20533.

(e) A safety catch shall be provided to prevent the track cutoff saw from leaving the track.

(2) Overhead deck splitter – panagraph.

(a) Panagraph splitters shall have a shroud incorporated on the upper pressure plate to eliminate the possibility of the splitter moving from the operating area. This shroud shall be constructed of solid design with a minimum width of three inches and a minimum thickness of three-eighths inch.

(b) Mechanically operated overhead splitters shall have handles moving opposite the stroke of the piston.

(c) When the leading edge of the panagraph splitter is completely extended, the maximum clearance from the deck to the splitting edge shall be two inches.

(3) Power splitter saw. Power splitters shall have spreaders behind the saw to prevent materials from squeezing the saw or being thrown back on the operator. The top of the saw shall be completely covered.

(4) Knee bolter circular saw.

(a) A safety catch shall be provided to prevent the bolter carriage from leaving the track.

(b) Bolter saws shall be provided with a canopy guard of sheet metal not less than one-eighth inch thick, or cast iron guard not less than three-sixteenths inch thick or a wood guard of not less than nominal four inch thick wood material or equivalent.

The bolter canopy guard shall completely enclose the rear portion of the saw. It shall be so arranged and adjusted as to cover the front of the saw; not to exceed twenty inches from the top of the carriage to the bottom of the guard on sixteen inch and eighteen inch block and twenty-six inches on twenty-four inch blocks, of the material being cut.

(c) Bolter saws shall be provided with wipers of belting or other suitable material. These wipers shall be installed on both sides of the saw in such a manner as to deflect knots, chips, slivers, etc., that are carried by the saw.

(d) A positive device shall be provided and used to manually lock and hold the feed table in the neutral position when not in use.

(e) That portion of all bolter saws which is below and behind the saw table shall be guarded by the exhaust hood or other device. Hinged or removable doors or gates will be permitted where necessary to permit adjusting and oiling.

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-70503, filed 8/27/81.]

**WAC 296-78-70505 Shake machinery.** (1) Shake splitters.

(a) A positive deenergizing device shall be provided within ready reach of each shake splitter operator.

(b) Each shake splitter shall be provided with an adjustable stroke limiter to eliminate the splitting blade from striking the table.

(c) All splitters shall have a maximum clearance of four inches, from the splitting edge to the table surface, when the splitter is in the extended position.

(d) All splitter tables shall have a friction surface to reduce kick out of the material being split.

(e) Shake splitters shall not be operated at a speed that would cause chunks to be thrown in such a manner as to create a hazard.

(f) The use of foot pedal (treadle) mechanisms shall be provided with protection to prevent unintended operation from falling or moving objects or by accidental stepping onto the pedal.

(i) The pedal shall have a nonslip surface.

(ii) The pedal return spring shall be of the compression type, operating on a rod or guided within a hole or tube, or designed to prevent interleaving of spring coils in event of breakage.

(iii) If pedal counterweights are provided, the path of the travel of the weight shall be enclosed.

(2) Shake saw guards.

(a) Every shake band saw shall be equipped with a saw guard on both sides of the blade down to the top side of the guide.

(b) The outside saw guard shall extend a minimum of three and one-half inches below the bottom edge of the saw guide.

(c) The maximum opening between the saw guide and table rolls shall be fifteen inches.

(3) Shake saw band wheel guards.

(a) The band wheels on all shake band saws shall be completely encased or guarded on both sides. The guards shall be constructed of not less than No. 14 U.S. gauge metal or material equal in strength.

(b) The metal doors, on such guards, shall have a wood liner of a minimum thickness of one-half inch.

(4) Shake saw band wheel speeds and maintenance.

(a) No band wheel shall be run at a peripheral speed in excess of that recommended by the manufacturer.

(b) Each band wheel shall be carefully inspected at least once a month by management.

Any band wheel in which a crack is found in the rim or in a spoke shall be immediately discontinued from service until properly repaired.

(c) Each band saw frame shall be provided with a tension indicator.

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-70505, filed 8/27/81.]

#### **WAC 296-78-70507 Upright shingle machine. (1) Upright shingle saw guard.**

(a) Every shingle machine carriage shall be equipped with a hand guard which:

(i) Projects at least one inch beyond the cutting edge of the saw.

(ii) Shall be located not more than one-half inch from the side of the saw blade.

(b) Shingle saw guards shall have a rim guard so designed and installed as to prevent chips and knots from flying from the saws. Such guards shall cover the edge of the saw to at least the depth of the teeth, except such part of the cutting edge as is essential for sawing the material.

(c) Saw arbors and couplings shall be guarded to prevent contact.

(d) Every part of a clipper saw blade, except that part which is exposed to trim shingles, shall be enclosed by a guard, so designed and installed to prevent contact with the clipper saw. An additional guard shall be installed not more than four inches above the clipper board and not more than one-half inch from the vertical plane of the saw.

(e) The underside of clipper saw boards shall be equipped with a finger guard to effectively protect the operator's fingers. The guard shall be a minimum of five inches long and one and one-quarter inches deep.

(2) Upright carriage guards.

(a) Automatic revolving cam set works and rocker arms, on machine frame, shall be guarded where exposed to contact.

(b) The spault catchers shall be not less than three-sixteenths inch thick and kept sharp at all times. Missing teeth shall be replaced.

(3) Carriage feed works.

(a) The pinion gear, bull wheel and Johnson bar, operating the saw carriage, shall be guarded where exposed to contact.

(b) Each shingle machine clutch treadle shall be arranged so that it is necessary to manually operate the treadle to start the machine. Devices which start the machine when the jaw treadle is released shall not be installed or used. The carriage shall have a brake to hold it in a neutral position.

(c) Carriage speed shall not exceed thirty-four strokes per minute.

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-70507, filed 8/27/81.]

#### **WAC 296-78-70509 Related shake and shingle sawing machinery. (1) Flat or taper saw. A wood or metal guard or its equivalent shall be secured to the sliding table at the side nearest the sawyer to protect him from contact with the cutting edge of the saw when a block is not in the cut.**

(2) Hip and ridge saws. The hip and ridge saws shall be guarded with a hood-like device. This guard shall cover that portion of the saw not needed to cut the material, located above the cutting table.

(a) The remaining portion of the saw, located below the table, shall be guarded to prevent contact by employees.

(b) The hip and ridge guarding standard is applicable to both shake and shingle hip and ridge saws.

(3) Shim stock saws. The top ends and sides of the shim stock saws shall be guarded. All shim stock saw power transmission mechanism shall be guarded.

(4) Shake or shingle groover. The top ends and sides of the groover, to include the press rolls, shall be guarded to contain material or debris which can be thrown and to prevent contact. All groover machine power transmission mechanism shall be guarded in compliance with WAC 296-78-710.

(5) Circular saws, speeds and repairs.

(a) Maximum allowable speeds.

(i) No circular saw shall be run at a speed in excess of that recommended by the manufacturer.

(ii) Such speed shall be etched or otherwise permanently marked on the blade, and that speed shall not be exceeded.

(b) Repairs and reconditions.

(i) Shingle saws when reduced in size to less than forty inches in diameter shall be discontinued from service as shingle saws on upright or vertical machines.

(ii) Shingle saws may be reconditioned for use as clipper saws provided the surface is reground and the proper balance attained.

(iii) Shingle saws may be used to no less than thirty-six inches on flat or taper saw machines.

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-70509, filed 8/27/81.]

**WAC 296-78-70511 Safety rules. (1) General.**

(a) Workers shall not leave shingle machines unattended while the carriage is in motion.

(b) Shingle blocks shall not be piled more than one tier high on tables or roll cases. Chunks may be placed horizontally one tier high on top of shingle blocks. Shingle blocks shall be piled in a stable manner, not more than seventy-two inches high, within the immediate working area of the shingle sawyer or the area shall be barricaded.

(c) Provisions shall be made to prevent blocks from falling into the packing area.

(d) On each machine operated by electric motors, positive means shall be provided for rendering such controls or devices inoperative while repairs or adjustments are being made to the machines they control.

(e) Workers shall not stand on top of blocks while in the process of splitting other blocks into bolts.

(2) Jointers (shingle). Shingle jointers shall have the front, or cutting face of the knives, housed except for a narrow slot through which the shingles may be fed against the knives.

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-70511, filed 8/27/81.]

**WAC 296-78-710 Construction and isolated equipment.**

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-710, filed 8/27/81.]

**WAC 296-78-71001 General. (1) Construction** when not specifically covered in these standards shall be governed by such other standards adopted by the department of labor and industries as may apply.

(2) All buildings, docks, tramways, walkways, log dumps and other structures shall be so designed, constructed, and maintained as to provide a safety factor of four. This means that all members shall be capable of supporting four times the maximum load to be imposed. This provision refers to buildings, docks and so forth designed and constructed subsequent to the effective date of these standards and also refers in all cases where either complete or major changes or repairs are made to such buildings, docks, tramways, walkways, log dumps and other structures.

(3) Basements on ground floors under mills shall be evenly surfaced, free from unnecessary obstructions and debris, and provided with lighting facilities in compliance with the requirements of the general occupational health standards, WAC 296-62-09003.

(4) All engines, motors, transmission machinery or operating equipment installed in mill basements or ground floors shall be equipped with standard safeguards for the protection of workers.

(5) Hazard marking. Physical hazard marking shall be as specified in WAC 296-24-135 through 296-24-13503 of the general safety and health standards.

(6) Flooring of buildings, ramps and walkways not subject to supporting motive equipment shall be of not less than two-inch wood planking or material of equivalent structural strength.

(7) Flooring of buildings, ramps, docks, trestles and other structure required to support motive equipment shall be of not less than full two and one-half inch wood planing or material of equivalent structural strength. However, where flooring is covered by steel floor plates, two inch wood planking or material of equivalent structural strength may be used.

(8) Walkways, docks, and platforms.

(a) Walkways, docks and platforms shall be constructed and maintained in accordance with the requirements of the general safety and health standards, WAC 296-24-735 through 296-24-75011.

(b) Maintenance. Walkways shall be evenly floored and kept in good repair.

(c) Where elevated platforms are used they shall be equipped with stairways or ladders in accordance with the general safety and health standards, WAC 296-24-765 through 296-24-81013.

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-71001, filed 8/27/81.]

**WAC 296-78-71003 Floor openings. (1) All floor openings** either temporary or permanent, shall be protected as required by the general safety and health standards, WAC 296-24-750 through 296-24-75011.

(2) The area under floor openings shall, where practical, be fenced off. When this is not practical, the areas shall be plainly marked with yellow lines and telldails shall be installed to hang within five and one-half feet of the ground or floor level.

(3) Where floor openings are used to drop materials from one level to another, audible warning systems shall be installed and used to indicate to employees on the lower level that material is to be dropped.

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-71003, filed 8/27/81.]

**WAC 296-78-71005 Floors, docks, platforms and runways. (1) Faces of docks** except on loading and unloading sides of rail and truck loading platforms, and runways used for the operation of lift trucks and other vehicles shall have a guard or shear timber eight by eight inches set over three inch blocks and securely fastened to the floor by bolts of not less than five-eighths inch diameter.

(2) The flooring of buildings, docks and passageways shall be kept in good repair at all times. When a hazardous condition develops that cannot be immediately repaired, the area shall be fenced off and not used until adequate repairs are made.

(3) All working areas shall be kept free from unnecessary obstruction and debris.

(4) Floors around machines and other places where workers are required to stand shall be provided with effective means to prevent slipping.

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-71005, filed 8/27/81.]

#### **WAC 296-78-71007 Footwalks and passageways.**

(1) All footwalks and passageways subject to slipping hazards due to peculiarities of conditions or processes of the operation shall be provided with nonslip surfaces.

(2) Walkways in accordance with WAC 296-78-71001(8) shall be provided over roll casings, transfer tables, conveyors or other moving parts except where stepping over such equipment is not in connection with usual and necessary traffic.

(3) Walkways alongside of sorting tables shall be of sufficient width to provide safe working area. Such walkways shall be evenly floored and kept in good repair at all times. They shall be kept free from obstructions and debris.

(4) When employees are required to clear plug-ups in veneer trays or lumber sorting trays, adequate walkways with standard guardrails shall be provided for access to the trays whenever possible. When walkways are not provided, safety belts or harnesses with lanyards, tied off to substantial anchorages, shall be provided and used at all times.

(5) Walkways and stairways with standard hand rails shall be provided wherever space will permit, for oilers and other employees whose duties require them to go consistently to elevated and hazardous locations.

(a) Where such passageways are over walkways or work areas, standard toeboards shall be provided.

(b) Protection as required by the general safety and health standard, WAC 296-24-205 through 296-24-20533 shall be provided against contact with transmission machinery or moving conveyors.

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-71007, filed 8/27/81.]

**WAC 296-78-71009 Stairways and ladders.** (1) Stairways shall be used in preference over ladders wherever possible. Stairways or ladders, whichever is used, shall be constructed and maintained in accordance with the provisions of the general safety and health standard, WAC 296-24-75009 through 296-24-81013.

(2) Doors shall not open directly on a flight of stairs.

(3) Permanent ladders shall be fastened securely at both top and bottom.

(4) Portable ladders shall not be used upon footing other than suitable type.

(5) Hooks or other means of securing portable ladders when in use, shall be provided.

(6) Portable ladders shall not be used for oiling machinery which is in motion.

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-71009, filed 8/27/81.]

**WAC 296-78-71011 Egress and exit.** (1) In all enclosed buildings, means of egress shall be provided in accordance with the provisions of the general safety and health standard, WAC 296-24-550 through 296-24-56531.

(2) All swinging doors shall be provided with windows, the bottom of which shall be not more than forty-eight inches above the floor. One window shall be provided for each section of double swinging doors. All such windows shall be of shatter proof or safety glass unless otherwise protected against breakage.

(3) Outside exits shall open outward. Where sliding doors are used as exits, an inner door not less than two feet six inches by six feet shall be cut inside each of the main doors and arranged to open outward.

(4) At least two fire escapes or substantial outside stairways, shall be provided for mill buildings where the floor level is more than eight feet above the ground.

(a) Buildings over one hundred fifty feet in length shall have at least one additional fire escape or substantial outside stairway for each additional one hundred fifty feet of length or fraction thereof.

(b) Passageways to fire escapes or outside stairways shall be marked and kept free of obstructions at all times.

(c) Fire protection. The requirements of WAC 296-24-585 through 296-24-62003 of the general safety and health standard, shall be complied with in providing the necessary fire protection for sawmills.

(d) Fire drills shall be held at least quarterly and shall be documented.

(5) Where a doorway opens upon a roadway, railroad track, or upon a tramway or dock over which vehicles travel, a barricade or other safeguard and a warning sign shall be placed to prevent workers from stepping directly into moving traffic.

(6) Tramways and trestles shall be substantially supported by piling or framed bent construction which shall be frequently inspected and maintained in good repair at all times. Tramways or trestles used both for vehicular and pedestrian traffic shall have a walkway with standard hand rail at the outer edge and shear timber on the inner edge, and shall provide three feet clearance to vehicles. When walkways cross over other thoroughfares, they shall be solidly fenced at the outer edge to a height of 42 inches over such thoroughfares.

(7) Where tramways and trestles are built over railroads they shall have a vertical clearance of twenty-two feet above the top of the rails. When constructed over carrier docks or roads, they shall have a vertical clearance of not less than six feet above the drivers foot rest on the carrier, and in no event shall this clearance be less than twelve feet from the surface of the lower roadway or dock.

(8) Walkways (either temporary or permanent) shall be not less than twenty-four inches wide and two inches



thick, nominal size, securely fastened at each end. When such walkways are used on an incline the angle shall not be greater than twenty degrees from horizontal.

(9) Walkways from the shore or dock to floats or barges shall be securely fastened at the shore end only and clear space provided for the other end to adjust itself to the height of the water.

(10) Cleats of one by four inch material shall be fastened securely across walkways at uniform intervals of eighteen inches whenever the grade is sufficient to create a slipping hazard.

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-71011, filed 8/27/81.]

**WAC 296-78-71013 Cableways.** (1)(a) Inclined cableways shall have a central line between the rails in practical alignment with the center of the hoisting drums. A substantial bumper shall be installed at the foot of each incline.

(b) Barricades or warning signs shall be installed to warn pedestrians to stand clear of the cables on inclined cableways. The cables shall not be put into motion without activating an alarm system, either audible or visible, which will inform anyone on the tracks to stand clear.

(2) Employees shall not ride on or stand below the cars on an inclined cableway.

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-71013, filed 8/27/81.]

**WAC 296-78-71015 Tanks and chemicals.** (1) All open vats and tanks into which workers may fall shall be guarded with standard railings or screen guards in all cases where such guarding is possible with regard to practical operation.

(2) Foundations of elevated tanks shall be accessible for inspections. When the tank platform is more than five feet above the ground a stairway or ladder shall be permanently attached.

(3) Every open tank over five feet in height shall be equipped with fixed standard ladders both inside and out, extending from the bottom to the rim of the tank arranged to be accessible to each other, so far as local conditions permit.

(4) The use of chemicals for treating of lumber for prevention of sap stain or mold or as preservatives, shall conform to the requirements of WAC 296-62-11021, open surface tanks.

(a) Storage, handling, and use of chemicals. Threshold limits. Employees shall not be exposed to airborne concentration of toxic dusts, vapors, mists or gases that exceed the threshold limit values set forth in WAC 296-62-070 through 296-62-080 of the general occupational health standards.

(b) Protective equipment. The use of chemicals shall be controlled so as to protect employees from harmful exposure to toxic materials. Where necessary, employees shall be provided with and required to wear such protective equipment as will afford adequate protection against harmful exposure as required by WAC 296-24-075 through 296-24-092 of the general safety and health standards.

(5)(a) Means shall be provided and used to collect any excess of chemicals used in treating lumber so as to protect workers from accidental contact with harmful concentrations of toxic chemicals or fumes.

(b) Dip tanks containing flammable or combustible liquids shall be constructed, maintained and used in accordance with WAC 296-24-405 of the general safety and health standards.

(c) An evacuation plan shall be developed and implemented for all employees working in the vicinity of dip tanks using flammable and/or combustible liquids. A copy of the plan shall be available at the establishment for inspection at all times. Every employee shall be made aware of the evacuation plan and know what to do in the event of an emergency and be evacuated in accordance with the plan. The plan shall be reviewed with employees at least quarterly and documented.

(d) When automatic foam, automatic carbon dioxide or automatic dry chemical extinguishing systems are used, an alarm device shall be activated to alert employees in the dip tank area before and during the activation of the system. The following combinations of extinguishment systems when used in conjunction with the evacuation plan as stated above will be acceptable in lieu of bottom drains:

(i) A dip tank cover with an automatic foam extinguishing system under the cover, or an automatic carbon dioxide system, or an automatic dry chemical extinguishing system, or an automatic water spray extinguishing system;

(ii) An automatic dry chemical extinguishing system with an automatic carbon dioxide system or a second automatic dry chemical extinguishing system or an automatic foam extinguishing system;

(iii) An automatic carbon dioxide system with a second automatic carbon dioxide system or an automatic foam extinguishing system.

(e) The automatic water spray extinguishing systems, automatic foam extinguishing systems, and dip tank covers shall conform with the requirements of WAC 296-24-405. The automatic carbon dioxide systems and dry chemical extinguishing system shall conform with the requirements of WAC 296-24-615 and 296-24-620.

(6) Where workers are engaged in the treating of lumber with chemicals or are required to handle lumber or other materials so treated, the workers shall be provided with, at no cost to the worker, and required to use such protective equipment as will provide complete protection against contact with toxic chemicals or fumes therefrom.

(7) Sanitation requirements. The requirements of WAC 296-24-120 through 296-24-13013 of the general safety and health standards, shall govern sanitation practices.

(8) The sides of steam vats and soaking pits unless otherwise guarded shall extend forty-two inches above the floor level. The floor adjacent thereto shall be of nonslip construction.



(9) Large steam vats or soaking pits, divided into sections, shall be provided with substantial walkways between each section, each walkway to be provided with standard railings which may be removable if necessary.

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-71015, filed 8/27/81.]

**WAC 296-78-71017 Dry kilns.** (1) Dry kilns shall be so constructed upon solid foundations that tracks will not sag. Dry kilns shall be provided with suitable walkways. Each kiln shall have doors that operate from the inside and be provided with escape doors of adequate height and width to accommodate an average size man, that also operates from the inside, and shall be located in or near the main door. Escape doors shall swing in the direction of exit. Kiln doors and door carriers shall be fitted with safety devices to prevent the doors or carriers from falling.

(2) Ladders. A fixed ladder, in accordance with the requirements of WAC 296-24-810 through 296-24-81009 of the general safety and health standards, or other means shall be provided to permit access to the roof. Where controls and machinery are mounted on the roof, a permanent stairway with standard handrail shall be installed in accordance with the requirements of WAC 296-24-765 through 296-24-76523 of the general safety and health standards.

(3) A heated room shall be provided for the use of the kiln operator in inclement weather. He should remain in such room for at least ten minutes after leaving a hot kiln before going to cold outside air.

(4) Where operating pits are used, they shall be well ventilated, drained and lighted. Substantial gratings shall be installed at the kiln floor line. Steam lines shall be provided with insulation wherever exposed to contact by employees. Fans shall be enclosed by standard safeguards.

(5) Mechanical equipment. All belts, pulleys, blowers, and other exposed moving equipment used in or about kilns shall be guarded in accordance with the requirements of WAC 296-24-205 through 296-24-20533 of the general safety and health standards.

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-71017, filed 8/27/81.]

**WAC 296-78-71019 Exhaust systems.** (1) Air requirements in buildings, where persons are habitually employed, shall meet the requirements of the general occupational health standard, WAC 296-62-100 through 296-62-11013.

(2) Where the natural ventilation is not sufficient to remove dust, fumes or vapors that create or constitute a hazard, additional means of removal shall be provided.

(3) All mills containing one or more machines whose operations create dust, shavings, chips or slivers during a period of time equal to or greater than one-fourth of the working day or shift, shall be equipped with a collecting system either continuous or automatic in action and of sufficient strength and capacity to thoroughly remove such refuse from the points of operation of the machines and the work areas.

[Title 296 WAC—p 1692]

(4) Each woodworking machine that creates dust, shavings, chips, or slivers shall be equipped with an exhaust or conveyor system located and adjusted to remove the maximum amount of refuse from the point of operation and immediate vicinity.

(5) Blower, collecting and exhaust systems shall be designed, constructed and maintained in accordance with American National Standards Z33.1 - 1961 (for the installation of blower and exhaust systems for dust, stock and vapor removal or conveying) and Z12.2 - 1962 (R1969) (code for the prevention of dust explosions in woodworking and wood flour manufacturing plants).

(6) Fans used for ventilating shall be of ample capacity, as evidenced by the performance schedules of the manufacturers, and shall be guarded when exposed to contact. Hoods, dust conveyors, dust collectors and other accessory equipment shall be large enough to insure free intake and discharge.

(7) The outlet or discharge of all ventilating equipment shall be so arranged that at no time will the dust, vapors, gases or other air borne impurities discharged, create or constitute a hazard.

(8) Where a hood is used to form a part or all of the guard required on a given machine, it shall be constructed of not less than ten U.S. gauge sheet metal, or if of cast iron it shall be not less than three-sixteenths inches in thickness.

(9) All exhaust pipes shall be of such construction and internal dimensions as to minimize the possibility of clogging. They shall be readily accessible for cleaning.

(10) All exhaust pipes shall empty into settling or dust chambers which shall effectively prevent the dust or refuse from entering any work area. Such settling or dust chambers shall be so designed and operated as to reduce to a minimum the danger of fire or dust explosions.

(11) In lieu of a general ventilating system, exhaust or blower units may be installed on the dust or fume producing machine, provided the required protection is secured thereby.

(12) When proper ventilation is not provided, and temporary hazardous conditions are therefore encountered, the employer shall furnish approved respiratory and visual equipment: *Provided, however,* That the exposure to such hazard shall not be for more than two hours duration. Protective measures and equipment shall meet the requirements of the general occupational health standard, WAC 296-62-070 through 296-62-09001 and the requirements of the general safety and health standard, WAC 296-24-081 through 296-24-08113.

(13) Provisions for the daily removal of refuse shall be made in all operations not required to have an exhaust system, or having refuse too heavy, or bulky, or otherwise unsuitable to be handled by an exhaust system.

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-71019, filed 8/27/81.]

**WAC 296-78-71021 Spray painting.** All spray painting operations shall be carried on in accordance with the requirements of the general safety and health

standard, WAC 296-24-370 through 296-24-37027 and the general occupational health standard, WAC 296-62-11019.

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-71021, filed 8/27/81.]

**WAC 296-78-71023 Lighting.** The lighting and illumination requirements of the general occupational health standards, WAC 296-62-09003, shall apply.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 82-13-045 (Order 82-22), § 296-78-71023, filed 6/11/82. Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-71023, filed 8/27/81.]

**WAC 296-78-71025 Gas piping and appliances.** All gas piping and appliances shall be installed in accordance with the American National Standard Requirements for Gas Appliances and Gas Piping Installations, Z21.30 - 1964.

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-71025, filed 8/27/81.]

**WAC 296-78-715 Mechanical, steam and electrical equipment.**

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-715, filed 8/27/81.]

**WAC 296-78-71501 General provisions.** (1) All machinery or other equipment located or used on the premises of the operation or in the processes incidental thereto, shall be provided and maintained with approved standard safeguards, irrespective of ownership.

(2) Machines shall be so located that each operator will have sufficient space in which to handle material with the least possible interference from or to other workers or machines.

(3) Machines shall be so placed that it will not be necessary for the operator to stand where passing traffic creates a hazard.

(4) Aisles of sufficient width to permit the passing of vehicles or employees without crowding shall be provided in all work areas and stock or storage rooms.

(5) All metal decking around machinery shall be equipped to effectively prevent slipping.

(6) All machinery or equipment started by a control so located as to create impaired vision of any part of such machinery or equipment shall be provided with an audible warning device, where such machinery or equipment is exposed to contact at points not visible to the operator. Such devices shall be sounded before starting up unless positive mechanical or electrical interlocking controls are provided which will prevent starting until all such posts are cleared.

(7) A mechanical or electrical power control device shall be provided at each machine which will make it possible for the operator to stop the machine feed without leaving his position at the point of operation.

(8) All machines operated by means of treadles, levers, or other similar devices, shall be provided with positive and approved nonrepeat devices except where such machine is being used as an automatic repeating device.

(9) Operating levers and treadles on all machines or machinery shall be so located and protected that they cannot be shifted or tripped accidentally.

(10) All power driven machinery shall be stopped and brought to a complete standstill before any repairs or adjustments are made or pieces of material or refuse removed, except where motion is necessary to make adjustments.

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-71501, filed 8/27/81.]

**WAC 296-78-71503 Lock out--Tag out.** (1) To avoid accidental activation of machinery, electrical devices or other equipment which could create a hazardous condition while performing maintenance, repair, cleanup or construction work, the main disconnect(s) (line circuit breakers) shall first be locked out and tagged in accordance with the following provisions:

(2) Effective date. Effective July 1, 1982, only padlocks or other equivalent protective devices shall be used for locking out the main disconnect(s) (line circuit breakers) of machinery, electrical devices or other equipment that is shut down while maintenance, repair, cleanup, construction work or other type of work is done to the equipment. Tags shall be used to supplement the padlocks or other equivalent protective devices, and shall be used only for informational purposes.

(3) Padlocks, tags or equivalent protective devices to be supplied. The employer shall supply and the employee(s) shall use as many padlocks or other equivalent protective devices as are necessary to effectively lock out all affected equipment.

(4) Lock out plan. An effective lock out plan shall be formulated in writing and all concerned employees so informed. The plan shall contain specific procedures for locking out equipment, information to be contained on supplemental tags and specific procedures for unlocking equipment after repairs, cleanup, etc., have been completed.

(5) Informational tags. Tags used for providing supplemental information with lock out padlocks or other equivalent protective devices shall contain the name of the person authorizing placement, reason for placing, date, signature of person placing tag and such other relative information as deemed necessary by the person placing the tag.

(6) Lock out by pushbutton only. Locking out a machine or item of equipment by use of a pushbutton or other local control device only will not be acceptable as meeting the intent of these rules.

(7) Coordination of locking out devices. When repair, adjustment, cleanup, maintenance or construction work is necessary and the lock out procedures must be followed by any person not familiar with all power sources or material entry sources to any area involved, that person shall consult with the operator, supervisor, or some person that is capable of informing him of proper lock out procedures and supplemental tagging information.

(8) Lock out before removing guards. Equipment shall be stopped and locked out before employees remove guards or reach into any potentially hazardous area. The

only exception to this rule will be when equipment must be in motion in order to make proper adjustments.

(9) Removal of lock outs. Each person actively engaged in the repair, maintenance, cleanup, etc., shall lock out the affected equipment and place the informational tag. Upon completion of the work and reinstallation of the guards, that person shall personally remove his lock and tag, except when it is positively determined that an employee has left the premises without removing his lock and tag, other persons may remove the locks and tags in accordance with a procedure formulated by each firm and approved by the division of industrial safety and health.

(10) Valves to be locked and tagged out. Each valve used to control the flow of hazardous materials into, or used to activate the equipment being worked on, shall be locked and tagged out.

(11) Piping systems deactivated. Prior to working on piping systems containing pressurized or hazardous materials, the valve(s) controlling the flow to the affected area shall be locked and tagged out. The piping in the area to be worked on shall be drained and purged, if needed. If the piping contains hazardous materials, the piping shall be isolated from the work area by the insertion of blank flanges in the piping system.

(12) Pipe lines without valves. If pipelines or ducts are constructed without valves or closures that can be locked out, the lines or ducts shall be broken at a flange and a blank flange inserted to stop accidental flow of any hazardous material.

(13) Testing after lock out. After locking out and tagging equipment, a test shall be conducted to ascertain that the equipment has been made inoperative or the flow of hazardous material has been positively stopped. Precautions shall be taken to ascertain that persons will not be subjected to hazard while conducting the test if power source or flow of material is not shut off.

(14) Temporary or alternate power to be avoided. Whenever possible, temporary or alternate sources of power to the equipment being worked on shall be avoided. If the use of such power is necessary, all affected employees shall be informed and the source of temporary or alternate power shall be identified.

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-71503, filed 8/27/81.]

**WAC 296-78-71505 Mechanical power transmission apparatus.** (1) Machines and other equipment shall not be oiled while in motion, unless provided with guards or other devices to permit oiling without any possibility of contact with moving parts of machinery.

(2) Inspections shall be made to assure that shaftings, bearings and machines are in proper alignment at all times and that bolts in shaft hangars, couplings and boxes are tight.

(3) Isolated bearings or other equipment not reached by walkway shall be served by a ladder or other means of safe access.

(4) Running belts under power on or off pulleys shall be accomplished by mechanical means which will not expose employees to moving elements of the operation.

(5) Counterweights located on or near passageways or work areas shall be provided with enclosures. Overhead counterweights shall be provided with substantial safety chains or cables, or otherwise secured against falling.

(6) The construction, operation, and maintenance of all mechanical power-transmission apparatus shall be in accordance with the requirements of WAC 296-24-205 through 296-24-20533 of the general safety and health standard.

(7) Baffles shall be erected, where necessary, to protect employees from breaking belts, chains, ropes or cables.

(8) Overhead horizontal belts, chains or rope drives shall be provided with guards.

(9) Hydraulic systems. Means shall be provided to block, chain, or otherwise secure equipment normally supported by hydraulic pressure so as to provide for safe maintenance.

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-71505, filed 8/27/81.]

**WAC 296-78-720 Boiler and pressure vessels.** Boilers and pressure vessels shall be constructed, maintained and inspected in accordance with the provisions of the boiler and unfired pressure vessel law, chapter 70.79 RCW, and chapter 296-104 WAC as administered by the boiler inspection section of the department of labor and industries.

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-720, filed 8/27/81.]

**WAC 296-78-725 Nonionizing radiation.** (1) Only qualified and trained employees shall be assigned to install, operate, adjust, and maintain laser equipment.

(2) Employees, when working in areas in which a potential exposure to direct or reflected laser light greater than 0.005 watts (5 milliwatts) exists, shall be provided with antilaser safety goggles which will protect for the specific wavelength of the laser and be of optical density (O.D.) adequate for the energy involved.

(3) Areas in which lasers are used shall be posted with standard laser warning placards.

(4) Beam shutters or caps shall be utilized, or the laser turned off, when laser transmission is not actually required. When the laser is left unattended for a substantial period of time, such as during lunch hour, overnight, or at change of shifts, the laser shall be turned off or shutters or caps shall be utilized.

(5) The laser beam shall not be directed at employees.

(6) The laser equipment shall bear such labels, logos and data placards to indicate maximum output and class designation as required of the manufacturer at time of sale, by I.A.W. Part 1040, CFR Title 21. Such labels, logos, data placards, etc., shall be maintained in a legible condition.

(7) Employees shall not be exposed to light intensities in excess of:

(a) Direct staring: One micro-watt per square centimeter;

(b) Incidental observing: One milliwatt per square centimeter;

(c) Diffused reflected light: Two and one-half watts per square centimeter.

(8) The laser equipment shall not be modified except by the manufacturer.

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-725, filed 8/27/81.]

**WAC 296-78-730 Electrical service and equipment.**

(1) Electrical service and equipment shall be constructed, maintained, inspected and operated in accordance with the provisions of chapter 19.28 RCW, chapter 296-46 WAC, WAC 296-24-950 through 296-24-955, and the electrical standard as promulgated by the division of building and construction safety inspection services.

(2) Repairs. Electrical repairs shall be made only by authorized and qualified personnel.

(3) Identification. Marks of identification on electrical equipment shall be clearly visible.

(4) Protective equipment. Rubber protective equipment shall be provided as required by WAC 296-24-092(1) of the general safety and health standard.

(5) Open switches. Before working on electrical equipment, switches shall be open and shall be locked out.

(6) Concealed conductors. Where electrical conductors are known to be concealed, no work shall be performed until such conductors are located.

(7) Overload relays. Overload relays shall be reset by authorized qualified personnel only.

(8) Passageways to panels. Passageways to switch centers or panels shall at all times be kept free from obstruction. Not less than three feet of clear space shall be maintained in front of switch centers or panels at all times.

(9) Bridging fuses. Fuses shall not be doubled or bridged.

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-730, filed 8/27/81.]

**WAC 296-78-735 Elevators, moving walks.** Elevators, moving walks and other lifting devices intended for either passenger or freight service shall be constructed, maintained, inspected and operated in accordance with the provisions of chapter 70.87 RCW, WAC 296-24-870 through 296-24-90009 of the general safety and health standards, and those specific standards which are applicable from the division of building and construction safety inspection services, elevator section.

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-735, filed 8/27/81.]

**WAC 296-78-740 Transportation--Lumber handling equipment--Cranes--Construction.** (1) All apparatus shall be designed throughout, with not less than the following factors of safety, under static full rated load stresses, based on ultimate strength of the material used:

Material	Factor of Safety
Cast iron . . . . .	12
Cast steel . . . . .	8
Structural steel . . . . .	5
Forged steel . . . . .	5
Cables . . . . .	5

(2) A notice shall be placed on every crane and hoist showing the maximum allowable load in pounds or tons. This notice shall be placed in such a manner as to be clearly legible from the floor.

(3) Cranes shall be of what is known as "all steel construction." No cast iron shall be used in parts subject to tension except in drums, trolley sides, bearings, brackets and brake shoes.

(4) The construction of cranes shall be such that all parts may be safely lubricated and inspected when cranes are not in operation.

(5) Bolts subject to stress shall be of the through type and all bolts shall be equipped with approved protection so that the bolt will not work loose or nuts work off.

(6) Outside crane cages shall be enclosed. There shall be windows on three sides of the cage and windows in the front, and the side opposite the door shall be the full width of the cage.

(7) Where a tool box or receptacle is used for the storing of oil cans, tools, etc., it shall be permanently secured in the cage or on the foot-walk of outside cranes and on the foot-walk of inside cranes. Tool boxes of hot metal cranes shall be constructed of metal.

(8) All gears on cranes shall be provided with standard guards.

(9) Keys projecting from revolving shafts shall be guarded.

(10) A braking apparatus shall be provided on every type of crane and shall be so designed and installed as to be capable of effectually braking a weight of at least one and one-half times the full rated load.

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-740, filed 8/27/81.]

**WAC 296-78-745 Electrical equipment.** (1) All exposed current-carrying parts except conductors, connected to circuits above three hundred volts to ground shall be so isolated, insulated, or guarded that no employee can come in contact with them. Exposed parts less than 300 volts shall be protected in some suitable way against possible accidental contact. Exposed metallic parts of conduit armored cable or molding shall be permanently grounded.

(2) Guards for the current-carrying parts of unisolated electrical equipment, such as controllers, motors, transformers, automatic cutouts, circuit breakers, switches, and other devices shall consist of cabinets, casings, or shields of permanently grounded metal or of insulating material.

(3) All parts of electrical equipment, such as fuses and the handles and arc chutes of circuit breakers, shall be so isolated or guarded that the liability of employees being struck or burned by sparking, flashing or movement during operation is reduced to a minimum.

(4) All exposed noncurrent carrying metal parts of electrical equipment shall be permanently grounded. The ground connection through well bonded track rails will be considered satisfactory.

(5) The metallic parts of portable cranes, derricks, hoists, and similar equipment on which wires, cables, chains, or other conducting objects are maintained shall be provided with an effective protective ground, where operated in the vicinity of supply lines.

(6) Readily accessible means shall be provided whereby all conductors and equipment located in cranes can be disconnected entirely from the source of energy at a point as near as possible to the main current collectors.

(7) Means shall be provided to prevent the starting and operation of equipment by unauthorized persons.

(8) The control levers of traveling cranes shall be so located that the operator can readily face the direction of travel.

(9) A hoist limiting device shall be provided for each hoist.

(10) All fuses shall be of the enclosed arcless type.

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-745, filed 8/27/81.]

**WAC 296-78-750 Chains, wire rope, cables and fiber rope.** (1) Ropes, cables, slings, and chains.

(a) Safe usage. Ropes, cables, slings, and chains shall be used in accordance with safe use practices recommended by the manufacturer or within safe limits recommended by the equipment manufacturer when used in conjunction with it.

(b) Proof testing. The employer shall ensure that before use, each new, repaired, or reconditioned alloy steel chain sling, including all welded components in the sling assembly, shall be proof tested by the sling manufacturer or equivalent entity, in accordance with paragraph 5.2 of the American Society of Testing and Materials Specification A391.65 (ANSI G61.1-1968). The employer shall retain the certificate of the proof test and shall make it available for examination. When a chain sling assembly is made up of segments of proof tested alloy chain and proof tested individual components such as mechanical coupling links, hooks and similar devices; it is not necessary to test the assembled unit, when appropriate test certification of individual components is available and the assembled sling is appropriately tagged by the manufacturer or equal entity. The sling shall not be used in excess of the rated capacity of the weakest component.

(c) Slings. Slings and their fittings and fastenings, when in use, shall be inspected daily for evidence of overloading, excessive wear, or damage. Slings found to be defective shall be removed from service.

(2) Proper storage shall be provided for slings while not in use.

(3) Protection shall be provided between the sling and sharp unyielding surfaces of the load to be lifted.

(4) Hooks. No open hook shall be used in rigging to lift any load where there is hazard from relieving the

tension on the hook from the load or hook catching or fouling.

(5) Ropes or cables. Wire rope or cable shall be inspected when installed and once each day thereafter, when in use. It shall be removed from hoisting or load-carrying service when kinked or when one of the following conditions exist:

(a) When three broken wires are found in one lay of 6 by 6 wire rope.

(b) When six broken wires are found in one lay of 6 by 19 wire rope.

(c) When nine broken wires are found in one lay of 6 by 37 wire rope.

(d) When eight broken wires are found in one lay of 8 by 19 wire rope.

(e) When marked corrosion appears.

(f) Wire rope of a type not described herein shall be removed from service when four percent of the total number of wires composing such rope are found to be broken in one lay.

(g) Condemned. When wire rope, slings or cables deteriorate through rust, wear, broken wires, kinking or other conditions, to the extent there is a reasonable doubt that the necessary safety factor is maintained, the use of such equipment shall be discontinued.

(6) Wire rope removed from service due to defects shall be plainly marked or identified as being unfit for further use on cranes, hoists, and other load-carrying devices.

(7) The ratio between the rope diameter and the drum, block, sheave, or pulley tread diameter shall be such that the rope will adjust itself to the bend without excessive wear, deformation, or injury. In no case shall the safe value of drums, blocks, sheaves, or pulleys be reduced when replacing such items unless compensating changes are made for rope used and for safe loading limits.

(8) Drums, sheaves, and pulleys. Drums, sheaves, and pulleys shall be smooth and free from surface defects liable to injure rope. Drums, sheaves, or pulleys having eccentric bores or cracked hubs, spokes, or flanges shall be removed from service.

(9) Connections. Connections, fittings, fastenings, and other parts used in connection with ropes and cables shall be of the quality, size and strength recommended by the manufacturer for the use intended. These connections shall be installed in accordance with the manufacturer's recommendations.

(10) Socketing, splicing, and seizing.

(a) Socketing, splicing, and seizing of cables shall be performed only by qualified persons.

(b) All eye splices shall be made in a manner recommended by the manufacturer and wire rope thimbles of proper size shall be fitted in the eye, except that in slings the use of thimbles shall be optional.

(11) Wire rope clips attached with U-bolts shall have these bolts on the dead or short end of the rope. The U-bolt nuts shall be retightened immediately after initial load carrying use and at frequent intervals thereafter. The number and spacing of clips shall be as follows:

Improved Plow Steel Diameter of Rope	Number of Clips (Drop Forged)	Required Other Material	Minimum Space Between Clips
3/8 to 5/8"	3	4	3-3/4"
3/4"	4	5	4-1/2"
7/8"	4	5	5-1/4"
1 "	5	6	6 "
1-1/8"	6	6	6-3/4"
1-1/4"	6	7	7-1/2"
1-3/8"	7	7	8-1/4"
1-1/2"	7	8	9 "

(a) When a wedge socket-type fastening is used, the dead or short end of the cable shall be clipped with a U-bolt or otherwise made secure against loosening.

(b) Fittings. Hooks, shackles, rings, pad eyes, and other fittings that show excessive wear or that have been bent, twisted, or otherwise damaged shall be removed from service.

(12) Running lines. Running lines of hoisting equipment located within six feet six inches of the ground or working level shall be boxed off or otherwise guarded, or the operating area shall be restricted.

(13) Preventing abrasion. The reeving of a rope shall be so arranged as to minimize chafing or abrading while in use.

(14) Sheave guards. Bottom sheaves shall be protected by close fitting guards to prevent cable from jumping the sheave.

(15) There shall be not less than two full wraps of hoisting cable on the drums of cranes and hoists at all times of operation.

(16) Where the cables are allowed to pile on the drums of cranes, the drums shall have a flange at each end to prevent the cables from slipping off the drum.

(17) Chains. Chains used in load carrying service shall be inspected before initial use and weekly thereafter.

If at any time any three-foot length of chain is found to have stretched one-third the length of a link it shall be discarded.

(18) Chains shall be spliced in compliance with the requirements of the general safety and health standard, WAC 296-24-29413.

(19) Wherever annealing of chains is attempted, it shall be done in properly equipped annealing furnaces and under the direct supervision of a competent person thoroughly versed in heat treating.

Chain shall be normalized or annealed periodically as recommended by the manufacturer.

#### (20) Fiber rope.

(a) Frozen fiber rope shall not be used in load carrying service.

(b) Fiber rope that has been subjected to acid shall not be used for load carrying purposes.

(c) Fiber rope shall be protected from abrasion by padding where it is fastened or drawn over square corners or sharp or rough surfaces.

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-750, filed 8/27/81.]

**WAC 296-78-755 Natural and synthetic fiber rope slings. (1) Sling use.**

(a) Fiber rope slings made from conventional three strand construction fiber rope shall not be used with loads in excess of the rated capacities prescribed in Tables D-16 through D-19 of Part "D" of the general safety and health standards, chapter 296-24 WAC.

(b) Slings not included in these tables shall be used only in accordance with the manufacturer's recommendations.

(2) Safe operating temperatures. Natural and synthetic fiber rope slings, except for wet frozen slings, may be used in a temperature range from minus 20°F to plus 180°F without decreasing the working load limit. For operations outside this temperature range and for wet frozen slings, the sling manufacturer's recommendations shall be followed.

(3) Splicing. Spliced fiber rope slings shall not be used unless they have been spliced in accordance with the following minimum requirements and in accordance with any additional recommendations of the manufacturer:

(a) In manila rope, eye splices shall consist of at least three full tucks, and short splices shall consist of at least six full tucks, three on each side of the splice center line.

(b) In synthetic fiber rope, eye splices shall consist of at least four full tucks, and short splices shall consist of at least eight full tucks, four on each side of the center line.

(c) Strand end tails shall not be trimmed flush with the surface of the rope immediately adjacent to the full tucks. This applies to all types of fiber rope and both eye and short splices. For fiber rope under one inch in diameter, the tail shall project at least six rope diameters beyond the last full tuck. For fiber rope one inch in diameter and larger, the tail shall project at least six inches beyond the last full tuck. Where a projecting tail interferes with the use of the sling, the tail shall be tapered and spliced into the body of the rope using at least two additional tucks (which will require a tail length of approximately six rope diameters beyond the last full tuck).

(d) Fiber rope slings shall have a minimum clear length of rope between eye splices equal to ten times the rope diameter.

(e) Knots shall not be used in lieu of splices.

(f) Clamps not designed specifically for fiber ropes shall not be used for splicing.

(g) For all eye splices, the eye shall be of such size to provide an included angle of not greater than sixty degrees at the splice when the eye is placed over the load or support.

(4) End attachments. Fiber rope slings shall not be used if end attachments in contact with the rope have sharp edges or projections.

(5) Removal from service. Natural and synthetic fiber rope slings shall be immediately removed from service if any of the following conditions are present:

(a) Abnormal wear.

(b) Powdered fiber between strands.

(c) Broken or cut fibers.

(d) Variations in the size or roundness of strands.

(e) Discoloration or rotting.

(f) Distortion of hardware in the sling.



(6) Repairs. Only fiber rope slings made from new rope shall be used. Use of repaired or reconditioned fiber rope slings is prohibited.

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-755, filed 8/27/81.]

**WAC 296-78-760 Synthetic web slings.** (1) Sling identification. Each sling shall be marked or coded to show the rated capacities for each type of hitch and type of synthetic web material.

(2) Webbing. Synthetic webbing shall be of uniform thickness and width and selvage edges shall not be split from the webbing's width.

(3) Fittings. Fittings shall be:

(a) Of a minimum breaking strength equal to that of the sling; and

(b) Free of all sharp edges that could in any way damage the webbing.

(4) Attachment of end fittings to webbing and formation of eyes. Stitching shall be the only method used to attach end fittings to webbing and to form eyes. The thread shall be in an even pattern and contain a sufficient number of stitches to develop the full breaking strength of the sling.

(5) Sling use. Synthetic web slings illustrated in Figure D-6 shall not be used with loads in excess of the rated capacities specified in Tables D-20 through D-22. Slings not included in these tables shall be used only in accordance with the manufacturer's recommendations.

(6) Environmental conditions. When synthetic web slings are used, the following precautions shall be taken:

(a) Nylon web slings shall not be used where fumes, vapors, sprays, mists or liquids of acids or phenolics are present.

(b) Polyester and polypropylene web slings shall not be used where fumes, vapors, sprays, mists or liquids of caustics are present.

(c) Web slings with aluminum fittings shall not be used where fumes, vapors, sprays, mists or liquids of caustics are present.

(7) Safe operating temperatures. Synthetic web slings of polyester and nylon shall not be used at temperatures in excess of 180°F. Polypropylene web slings shall not be used at temperatures in excess of 200°F.

(8) Repairs.

(a) Synthetic web slings which are repaired shall not be used unless repaired by a sling manufacturer or an equivalent entity.

(b) Each repaired sling shall be proof tested by the manufacturer or equivalent entity to twice the rated capacity prior to its return to service. The employer shall retain a certificate of the proof test and make it available for examination.

(c) Slings, including webbing and fittings, which have been repaired in a temporary manner shall not be used.

(9) Removal from service. Synthetic web slings shall be immediately removed from service if any of the following conditions are present:

(a) Acid or caustic burns;

(b) Melting or charring of any part of the sling surface;

(c) Snags, punctures, tears or cuts;

(d) Broken or worn stitches; or

(e) Distortion of fittings.

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-760, filed 8/27/81.]

**WAC 296-78-765 Floor operated cranes.** (1) An unobstructed aisle not less than three feet wide shall be maintained for travel of the operator except in such cases where the control handles are hung from the trolleys of traveling cranes.

(2) The controller or controllers, if rope operated, shall automatically return to the "off" position when released by the operator.

(3) Pushbuttons, in pendant stations, shall return to the "off" position when pressure is released by the crane operator.

(4) All pushbuttons shall be marked to indicate their purpose.

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-765, filed 8/27/81.]

**WAC 296-78-770 Operators.** (1) Cranes shall be operated only by regular crane operators, authorized substitutes who have had adequate experience and training under the supervision of a competent operator, or by crane repair person or inspectors.

(2) No person under the age of eighteen years shall be permitted to operate a crane.

(3) Operators shall be required to pass a practical examination limited to the specific type of equipment to be operated. Operators shall meet the following physical qualifications:

(a) Have vision of at least 20/30 Snellen in one eye, and 20/50 in the other, with or without corrective lenses.

(b) Be able to distinguish red, green, and yellow, regardless of position of colors, if color differentiation is required for operation.

(c) Hearing, with or without hearing aid, must be adequate for the specific operation.

(d) A history of epilepsy or an uncorrected disabling heart condition shall be cause for a doctor decision to determine qualifications to operate a crane.

(4) Hands shall be kept free when going up and down ladders. Articles which are too large to go into pockets or belts shall be lifted to or lowered from the crane by hand line. (Except where stairways are provided.)

(5) Cages shall be kept free of clothing and other personal belongings. Tools, extra fuses, oil cans, waste and other articles necessary in the crane cage shall be stored in a tool box and not left loose on or about the crane.

(6) The operator shall familiarize himself fully with all crane rules and with the crane mechanism and its proper care. If adjustments or repairs are necessary, he shall report the same at once to the proper authority.

(7) The operator shall not eat, smoke or read while actually engaged in the operation of the crane.

(8) The operator or someone especially designated shall lubricate all working parts of the crane.



(9) Cranes shall be examined for loose parts or defects each day on which they are in use.

(10) Sawdust, oil or other debris shall not be allowed to accumulate to create a fire, health or slipping hazard.

(11) Operators shall avoid, as far as possible, carrying loads over workers. Loads shall not be carried over employees without sounding an audible warning alarm.

(12) Whenever the operator finds the main or emergency switch open, he shall not close it, even when starting on regular duty, until he has made sure that no one is on or about the crane. He shall not oil or repair the crane unless the main switch is open.

(13) If the power goes off, the operator shall immediately throw all controllers to "off" position until the power is again available.

(14) Before closing the main switch the operator shall make sure that all controllers are in "off" position until the power is again available.

(15) The operator shall pay special attention to the block, when long hitches are made, to avoid tripping the limit switch.

(16) The operator shall recognize signals only from the person who is supervising the lift except for emergency stop signals. Operating signals shall follow established standard crane signals as illustrated in WAC 296-78-830 of this chapter. Whistle signals may be used where one crane only is in operation. Cranes shall have audible warning device which shall be sounded in event of emergency.

(17) Before starting to hoist, the operator shall place the trolley directly over the load to avoid swinging it when being hoisted.

(18) The operator shall not make side pulls with the crane except when especially instructed to do so by the proper authority.

(19) When handling maximum loads, the operator shall test the hoist brakes after the load has been lifted a few inches. If the brakes do not hold, the load shall be lowered at once and the brakes adjusted or repaired.

(20) Bumping into runway stops or other cranes shall be avoided. When the operator is ordered to engage with or push other cranes, he shall do so with special care for the safety of persons on or below cranes.

(21) When lowering a load, the operator shall proceed carefully and make sure that he has the load under safe control.

(22) When leaving the cage the operator shall throw all controllers to "off" position and open the main switch.

(23) If the crane is located out of doors the operator shall lock the crane in a secure position to prevent it from being blown along or off the track by a severe wind.

(24) Railroad cars shall not be pulled along the tracks with sidepulls on an overhead crane.

(25) Operators shall not move the crane or a load unless floor signals are clearly understood.

(26) The rated lifting capacity of a crane shall not be exceeded. If any doubt exists about the weight of a load which might exceed the rated capacity, the foreman in charge must be contacted before any attempt is made to

lift the load. The foreman shall determine that the load is within the rated capacity of the crane or the load shall not be lifted.

(27) Crane operators and floorpersons shall coordinate their activities on every lift or movement of the crane. Both the operator and signalperson shall clearly understand any problem a movement might create with regard to surrounding materials, structures, equipment or personnel.

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-770, filed 8/27/81.]

**WAC 296-78-775 Signalpersons.** (1) Signalpersons shall give all the signals to the operator in accordance with established standard signals as illustrated in WAC 296-78-830 of this chapter.

(2) A designated person shall be responsible for the condition and use of all hoisting accessories and for all hitches.

(3) Before an operator moves a crane upon which an empty chain or cable sling is hanging, both ends of the sling shall be placed on the hook.

(4) Signalpersons, where necessary, shall walk ahead of the moving load and warn people to keep clear of it. They shall see that the load is carried high enough to clear all obstructions.

(5) Signalpersons shall notify the person in charge in advance when an extra heavy load is to be handled.

(6) No person shall be permitted to stand or pass under an electric magnet in use.

(7) The electrical circuit for electric magnets shall be maintained in good condition. Means for taking up the slack cable shall be provided.

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-775, filed 8/27/81.]

**WAC 296-78-780 Repairpersons.** (1) When repairs are necessary, repairpersons shall have the crane run to a location where the repair work will least interfere with the other cranes and with operations on the floor.

(2) Before starting repairs, repairpersons shall see that all controllers are thrown to the "off" position, and that main or emergency switches are opened; one of these shall be locked out in compliance with WAC 296-78-715(11) of this chapter.

(3) Repairpersons shall immediately place warning signs or "Out of Order" signs on a crane to be repaired and also on the floor beneath or hanging from the crane so that it can easily be seen from the floor. If other cranes are operated on the same runway, repairpersons shall also place rail stops at a safe distance or make other safe provisions.

(4) When repairing runways, repairpersons shall place rail stops and warning signs or signals so as to protect both ends of the section to be repaired.

(5) Repairpersons shall take care to prevent loose parts from falling or being thrown upon the floor beneath.

(6) Repairs shall not be considered complete until all guards and safety devices have been put in place and the

block and tackle and other loose material have been removed.

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-780, filed 8/27/81.]

**WAC 296-78-785 Construction requirements.** (1) Calculations for wind pressure on outside overhead traveling cranes shall be based on not less than 30 pounds per square foot of exposed surface.

(2) No overhung gears shall be used unless provided with an effective means of keeping them in place, and keys shall be secured to prevent gears working loose.

Safety lugs or brackets shall be provided on the trolley frames and bridge ends of overhead traveling cranes, so that in the event of a broken axle or wheel the trolley or bridge proper will not have a drop greater than one inch.

(3) Where there are no members over an outside overhead crane suitable for attaching blocks for repair work, and a locomotive crane is not available, a structural steel outrigger of sufficient strength to lift the heaviest part of the trolley shall be provided.

(4) Outside overhead traveling cranes shall be equipped with wind indicators and rail clamps as required by the general safety and health standards, WAC 296-24-23503.

(5) Foot brakes, or other effective means shall be provided to control the bridge travel of all overhead traveling cranes.

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-785, filed 8/27/81.]

**WAC 296-78-790 Crane platforms and footwalks.** (1) Platforms shall be provided when changing and repairing truck wheels on end trucks.

(2) A platform or footwalk shall be located on crane or crane runway to give access to the crane cage, and it shall be accessible from one or more stairways or fixed ladders. This platform or footwalk shall be not less than eighteen inches in width.

(3) Where stairways are used to give access to platforms they shall make an angle of not more than fifty degrees with the horizontal and shall be equipped with substantial railing. If ladders are used to give access to platforms they shall extend not less than thirty-six inches above the platform. Railed stairways or ladders to be used as a means of ingress and egress to crane cages shall be located at either or both ends.

(4) A footwalk shall be placed along the entire length of the bridge on the motor side, and a short platform twice the length of the trolley placed at one end of the girder on the opposite side, with a vertical clearance of at least six feet six inches where the design of crane or building permits, but in no case shall there be less than four feet clearance. For hand operated cranes the footwalk shall not be required to be installed on the bridge of the crane, but there shall be a repair platform equal in strength and design to that required for motor operated cranes, installed on the wall of the building or supported by the crane runway at a height equal to the lower edge of the bridge girder to facilitate necessary repairs.

[Title 296 WAC—p 1700]

(5) Clear width of footwalks shall not be less than eighteen inches except around the bridge motor where it may be reduced to fifteen inches.

(6) Footwalks shall be of substantial construction and rigidly braced. Footwalks for outside service shall be constructed so as to provide proper drainage, but the cracks between the boards shall not be wider than one-fourth inch.

(7) Every footwalk shall have a standard railing and toeboard at all exposed edges. Railings and toeboards shall conform in construction and design with the following requirements:

(a) Railings shall be not less than thirty-six inches nor more than forty-two inches in height, with an additional rail midway between the top rail and the floor.

(b) Pipe railings shall be not less than one and one-fourth inch inside diameter if of iron or be not less than one and one-half inches outside diameter if of brass tubing.

(c) Metal rails other than pipe shall be at least equal in strength to that of one and one-half by three-sixteenths inch angle and shall be supported by uprights of equal strength.

(d) Posts or uprights shall be spaced not more than eight feet center to center.

(e) Toeboards shall be not less than four inches in height.

(f) Toeboards shall be constructed in a permanent and substantial manner of metal, wood, or other material equivalent thereto in strength. Where of wood, toeboards shall be at least equal in cross section to one inch by four inches; where of steel at least one-eighth inch by four inches; where of other construction at least equal to the requirements for steel. Perforations up to one-half inch are permissible in metal toeboards.

(8) No openings shall be permitted between the bridge footwalk and the crane girders. Where wire mesh is used to fill this opening the mesh openings shall be not greater than one-half inch.

(9) All footwalks and platforms shall be so designed as to be capable of sustaining a concentrated load of one hundred pounds per lineal foot.

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-790, filed 8/27/81.]

**WAC 296-78-795 Crane cages.** (1) Safe means of escape shall be provided for operators of all cranes in all operating locations. Rope ladders shall not be used as a regular means of access but may be installed as an emergency escape device to be used in the event of fire, mechanical breakdown or other emergency.

(2) The operator's cage shall be located at a place from which signals can be clearly distinguishable, and shall be securely fastened in a place and well braced to minimize vibration. It shall be large enough to allow ample room for the control equipment and the operator. The operator shall not be required to step over an open space of more than eighteen inches when entering the cage.

(3) Cab operated cranes shall be equipped with a portable fire extinguisher which meets the requirements

of the general safety and health standard, WAC 296-24-590 through 296-24-59007.

(4) In establishments where continuous loud noises prevail such as caused by the operation of pneumatic tools, steam exhausts from boilers, etc., adequate signals shall be installed on cranes or one or more employees shall be placed on the floor for each crane operated to give warning to other employees of the approach of a crane with a load. Where there are more than two cranes on the same runway or within the same building structure, signaling devices are required to give warning to other employees of the approach of a crane with a load.

(5) Cages of cranes subjected to heat from below shall be of noncombustible construction and shall have a steel plate shield not less than one-eighth inch thick, placed not less than six inches below the bottom of the floor of the cage.

(6) Outside crane cages shall be enclosed. There shall be windows on three sides of the cage. The windows in the front and the side opposite the door shall be the full width of the cage.

(7) The floor of the cage on out-door cranes shall be extended to form an entrance landing which shall be equipped with a handrail and toeboard constructed to the specifications of WAC 296-78-790 of this chapter.

(8) A copy of the rules for operators shall be permanently posted in the cages of all cage-operated cranes.

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-795, filed 8/27/81.]

**WAC 296-78-800 Crane rail stops, bumpers and fenders.** (1) Rail stops shall be provided at both ends of the crane runway and at ends of the crane bridge. When two trolleys are operated on the same bridge rails, bumpers shall be provided to prevent collision of trolleys.

(2) Bumpers and rail stops shall extend at least as high as the centers of the wheel.

(3) Rail stops shall be fastened to the girders or girders and rails, but not to the rails alone. This does not apply to portable rail stops. Portable rail stops shall not be used as permanent rail stops.

(4) Rail stops shall be built up of plates and angles or be made of cast steel.

(5) Fenders shall be installed which extend below the lowest point of the treads of gantry type crane wheels. They shall be of a shape and form that will tend to push or raise an employee's hand, arm or leg off the rail and away from the wheel.

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-800, filed 8/27/81.]

**WAC 296-78-805 Crawler locomotive and truck cranes.** Crawler locomotive and truck cranes shall be constructed, maintained, inspected and operated in accordance with the provisions of WAC 296-24-240 through 296-24-24019 of the general safety and health standards.

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-805, filed 8/27/81.]

(1989 Ed.)

**WAC 296-78-810 Chain and electric hoists.** (1) Chain and electric hoists shall be of what is known as "all steel construction." No cast iron shall be used in parts subject to tension except drums, bearings or brake shoes.

(2) The chains shall be made of the best quality steel or iron with welded links.

(3) Chain and electric hoists shall have a factor of safety of at least five.

(4) Chain and electric hoists shall be equipped with a device which will automatically lock the load when hoisting is stopped.

(5) Electric hoists shall be provided with a limit stop to prevent the hoist block from traveling too far in case the operating handle is not released in time.

(6) Workers shall not ride the load of any chain or electric hoist. If necessary to balance the load manually, it shall be done from a safe distance.

(7) The rated capacity of the hoist shall be posted on both the hoist and the jib or rail.

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-810, filed 8/27/81.]

**WAC 296-78-815 Monorail hoists.** (1) No attempt shall be made with a monorail hoist to lift or move an object by a side pull, unless designed for that purpose.

(2) A stop shall be provided at all switches and turntables which will prevent the trolley from running off should the switch be turned or be left in the open position.

(3) All monorail hoists operating on swivels shall be equipped with one or more safety catches which will support the load should a suspension pin fail. All trolley frames shall be safeguarded against spreading.

(4) Rail stops shall be provided at the ends of crane runways. Such rail stops shall extend at least as high as the centers of the wheels.

(5) All monorail hoists shall have the rated capacity posted on both the hoist and the rail.

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-815, filed 8/27/81.]

**WAC 296-78-820 Air hoists.** (1) To prevent piston rod lock nuts from becoming loose and allowing rod to drop when supporting a load, lock nut shall be secured to piston rod by a castellated nut and cotter-pin.

(2) A clevis, "D" strap or other means shall be used to prevent the hoist cylinder becoming detached from the hanger.

(3) All air hoists shall have their rated capacity posted on both the hoist and the jib or rail.

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-820, filed 8/27/81.]

**WAC 296-78-825 Jib, pillar, and portable floor cranes, crabs, and winches.** (1) Side pulls shall not be made with jib or pillar cranes. The arm or boom shall be directly over the load when making a lift.

(2) The gears of all cranes shall be enclosed, and if hand operated by means of a crab or winch, a locking

[Title 296 WAC—p 1701]

dog shall be provided to hold load when the handle is released.

(3) Some form of brake or safety lowering device shall be provided on all crabs, winches, and jib cranes.

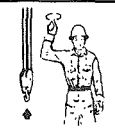
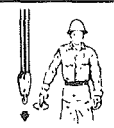


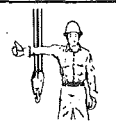
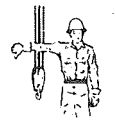

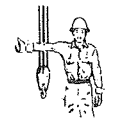
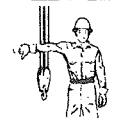
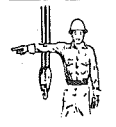

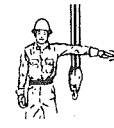
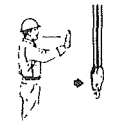




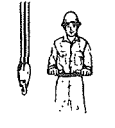


(4) A hoist limiting device shall be provided on all jib cranes of ten or more tons capacity.

(5) The rated capacity of the hoisting device shall be posted on the hoist and the arm or boom.

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-825, filed 8/27/81.]

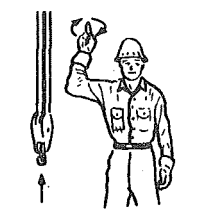
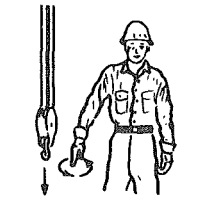
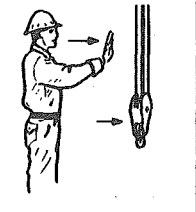

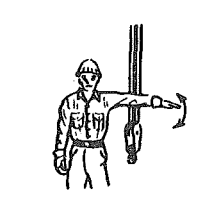
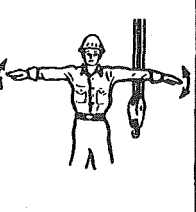
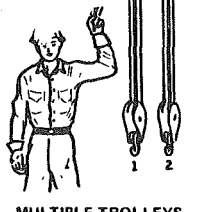
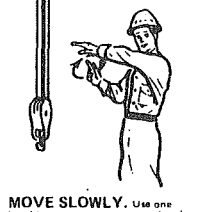
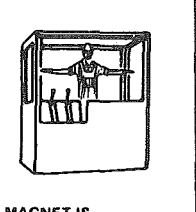
**WAC 296-78-830 Standard crane hand signals—**  
**Illustrations.** (1) The following hand signals shall be used for crawler, locomotive, and truck cranes and a copy shall be posted in the cab at the operator's station.

**CRAWLER, LOCOMOTIVE, AND TRUCK CRANES**

				
<b>HOIST.</b> With forearm vertical, forefinger pointing up, move hand in small horizontal circle.	<b>LOWER.</b> With arm extended downward, forefinger pointing down, move hand in small horizontal circles.	<b>USE MAIN HOIST.</b> Top fist on head; then use regular signals.	<b>USE WHIPLINE (Auxiliary Hoist).</b> Top elbow with one hand; then use regular signals.	<b>RAISE BOOM.</b> Arm extended, fingers closed, thumb pointing upward.
				
<b>LOWER BOOM.</b> Arm extended, fingers closed, thumb pointing downward.	<b>MOVE SLOWLY.</b> Use one hand to give any motion signal and place other hand motionless in front of hand giving the motion signal. (Hoist slowly shown as example.)	<b>RAISE THE BOOM AND LOWER THE LOAD.</b> With arm extended, thumb pointing up, first fingers in and out as long as load movement is desired.	<b>LOWER THE BOOM AND RAISE THE LOAD.</b> With arm extended, thumb pointing down, first fingers in and out as long as load movement is desired.	<b>SWING.</b> Arm extended, point with finger in direction of swing of boom.
				
<b>STOP.</b> Arm extended, palm down, hold position rigidly.	<b>EMERGENCY STOP.</b> Arm extended, palm down, move hand rapidly right and left.	<b>TRAVEL.</b> Arm extended forward, hand open and slightly raised, make pushing motion in direction of travel.	<b>DOG EVERYTHING.</b> Clasp hands in front of body.	<b>TRAVEL (Both Tracks).</b> Use both fists in front of body, making a circular motion about each other, indicating direction of travel forward or backward. (For crawler cranes only.)
				
<b>TRAVEL (One Track).</b> Lock the track on side indicated by raised fist. Travel opposite track in direction indicated by circular motion of other fist, rotated vertically in front of body. (For crawler cranes only.)	<b>EXTEND BOOM (Telescoping Booms).</b> Both fists in front of body with thumbs pointing outward.	<b>RETRACT BOOM (Telescoping Booms).</b> Both fists in front of body with thumbs pointing toward each other.	<b>EXTEND BOOM (Telescoping Booms).</b> One Hand Signal. One fist in front of chest, thumb tapping chest.	<b>RETRACT BOOM (Telescoping Booms).</b> One Hand Signal. One fist in front of chest, thumb pointing outward and heel of fist tapping chest.

(2) The following hand signals shall be used for overhead and gantry cranes and a copy shall be posted in the cab at the operator's station.

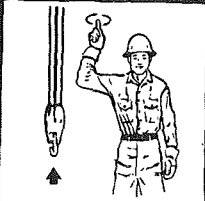
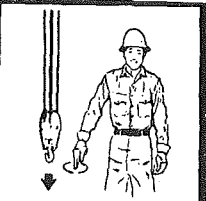
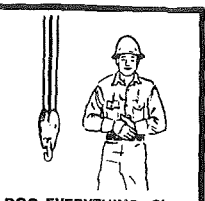
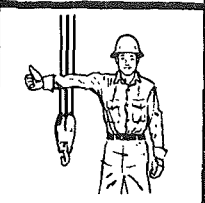
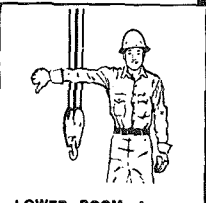
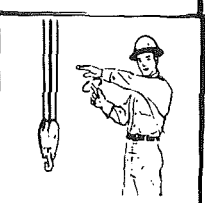
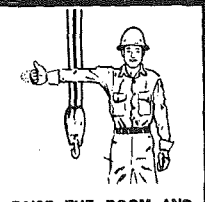
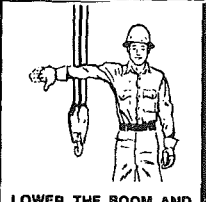
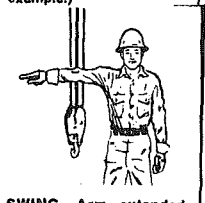
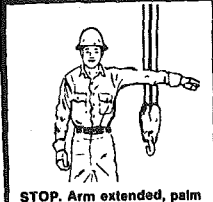
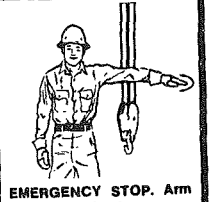
**STANDARD HAND SIGNALS FOR CONTROLLING OVERHEAD AND GANTRY CRANES**

		
<b>HOIST.</b> With forearm vertical, forefinger pointing up, move hand in small horizontal circle.	<b>LOWER.</b> With arm extended downward, forefinger pointing down, move hand in small horizontal circles.	<b>BRIDGE TRAVEL.</b> Arm extended forward, hand open and slightly raised, make pushing motion in direction of travel.
		
<b>TROLLEY TRAVEL.</b> Palm up, fingers closed, thumb pointing in direction of motion, jerk hand horizontally.	<b>STOP.</b> Arm extended, palm down, move arm back and forth.	<b>EMERGENCY STOP.</b> Both arms extended, palms down, move arms back and forth.
		
<b>MULTIPLE TROLLEYS.</b> Hold up one finger for block marked "1" and two fingers for block marked "2". Regular signals follow.	<b>MOVE SLOWLY.</b> Use one hand to give any motion signal and place other hand motionless in front of hand giving the motion signal. (Hoist slowly shown as example.)	<b>MAGNET IS DISCONNECTED.</b> Crane operator spreads both hands apart palms up.

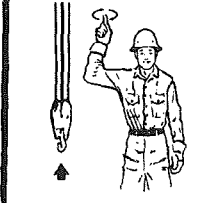
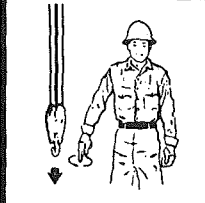
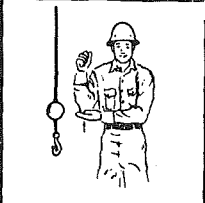
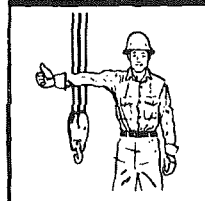
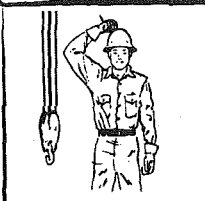
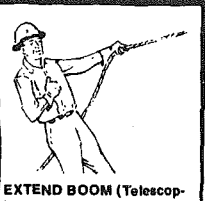
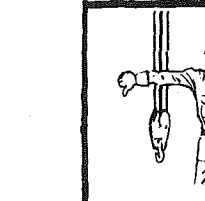
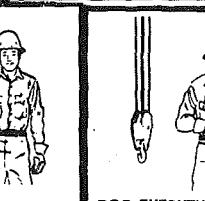
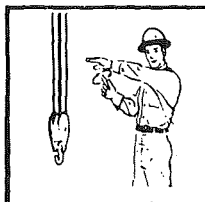
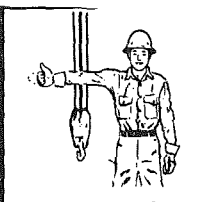
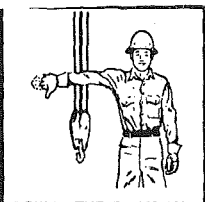
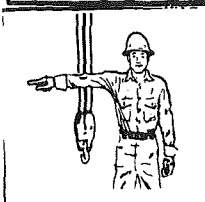
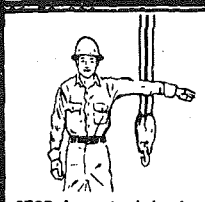

(3) The following hand signals shall be used for derricks and a copy shall be posted in the cab at the operator's station.

(4) The following hand signals shall be used for portal, tower, and pillar cranes and a copy shall be posted in the cab at the operator's station.

STANDARD HAND SIGNALS FOR CONTROLLING DERRICKS

		
<b>HOIST.</b> With forearm vertical, forefinger pointing up, move hand in small horizontal circle.	<b>LOWER.</b> With arm extended downward, forefinger pointing down, move hand in small horizontal circles.	<b>DOG EVERYTHING.</b> Clasp hands in front of body.
		
<b>RAISE BOOM.</b> Arm extended, fingers closed, thumb pointing upward.	<b>LOWER BOOM.</b> Arm extended, fingers closed, thumb pointing downward.	<b>MOVE SLOWLY.</b> Use one hand to give any motion signal and place other hand motionless in front of hand giving the motion signal. (Hoist slowly shown as example.)
		
<b>RAISE THE BOOM AND LOWER THE LOAD.</b> With arm extended, thumb pointing up, flex fingers in and out as long as load movement is desired.	<b>LOWER THE BOOM AND RAISE THE LOAD.</b> With arm extended, thumb pointing down, flex fingers in and out as long as load movement is desired.	<b>SWING.</b> Arm extended, point with finger in direction of swing of boom.
		
<b>STOP.</b> Arm extended, palm down, hold position rigidly.	<b>EMERGENCY STOP.</b> Arm extended, palm down, move hand rapidly right and left.	

STANDARD HAND SIGNALS FOR CONTROLLING PORTAL, TOWER AND PILLAR CRANES

		
<b>HOIST.</b> With forearm vertical, forefinger pointing up, move hand in small horizontal circle.	<b>LOWER.</b> With arm extended downward, forefinger pointing down, move hand in small horizontal circles.	<b>USE WHIPLINE (Auxiliary Hoist).</b> Tap elbow with one hand; then use regular signals.
		
<b>RAISE BOOM.</b> Arm extended, fingers closed, thumb pointing upward.	<b>USE MAIN HOIST.</b> Tap flat on head; then use regular signals.	<b>EXTEND BOOM (Telescoping Boom).</b> One Hand Signal. One flat in front of chest with thumb tapping chest.
		
<b>LOWER BOOM.</b> Arm extended, fingers closed, thumb pointing downward.	<b>DOG EVERYTHING.</b> Clasp hands in front of body.	
		
<b>MOVE SLOWLY.</b> Use one hand to give any motion signal and place other hand motionless in front of hand giving the motion signal. (Hoist slowly shown as example.)	<b>RAISE THE BOOM AND LOWER THE LOAD.</b> With arm extended, thumb pointing up, flex fingers in and out as long as load movement is desired.	<b>LOWER THE BOOM AND RAISE THE LOAD.</b> With arm extended, thumb pointing down, flex fingers in and out as long as load movement is desired.
		
<b>SWING.</b> Arm extended, point with finger in direction of swing of boom.	<b>STOP.</b> Arm extended, palm down, hold position rigidly.	<b>EMERGENCY STOP.</b> Arm extended, palm down, move hand rapidly right and left.

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-830, filed 8/27/81.]

**WAC 296-78-835 Vehicles. (1) Vehicles.**

(a) Scope. Vehicles shall include all mobile equipment normally used in sawmill, planing mill, storage, shipping, and yard operations, including log sorting yards.

(b) Lift trucks. Lift truck shall be designed, constructed, maintained and operated in accordance with the requirements of WAC 296-24-230 through 296-24-23035 of the general safety and health standards.

(c) Carriers. Drive chains on lumber carriers shall be adequately guarded to prevent contact at the pinch points.

(d)(i) Lumber carriers shall be so designed and constructed that the operator's field of vision shall not be unnecessarily restricted.

(ii) Carriers shall be provided with ladders or equivalent means of access to the operator's platform or cab.

(e) Lumber hauling trucks.

(i) On trucks where the normal operating position is ahead of the load in the direction of travel, the cab shall be protected by a barrier at least as high as the cab. The barrier shall be capable of stopping the weight of the load capacity of the vehicle if the vehicle were to be stopped suddenly while traveling at its normal operating speed. The barrier shall be constructed in such a manner that individual pieces of a normal load will not go through openings in the barrier.

(ii) Stakes, stake pockets, racks, tighteners, and binders shall provide a positive means to secure the load against any movement during transit.

(iii) Where rollers are used, at least two shall be equipped with locks which shall be locked when supporting loads during transit.

(2) All vehicles used in a sawmill, lumber yard, factory or other establishment shall be equipped with audible warning signals that shall be maintained in good order at all times.

(3) Flywheels, gears, sprockets and chains and other exposed parts that constitute a hazard to workers shall be enclosed in standard guards.

(4) All vehicles operated after dark or in any area of reduced visibility shall be equipped with head lights which adequately illuminate the direction of travel for the normal operating speed of the vehicle. The vehicle shall also be equipped with tail lights which are visible enough to give sufficient warning to surrounding traffic at the normal traffic operating speed.

(5) All vehicles operated in areas where overhead hazards exist shall be equipped with an overhead guard for the protection of the operator.

(6) Where vehicles are so constructed and operated that there is a possibility of the operator being injured by backing into objects, a platform guard shall be provided and so arranged as not to hinder the exit of the driver.

(7) Trucks, lift trucks and carriers shall not be operated at excessive rates of speed. When operating on tramways or docks more than six feet above the ground

or lower level they shall be limited to a speed of not more than twelve miles per hour. When approaching blind corners they shall be limited to four miles per hour.

(8) Vehicles shall not be routed across principal thoroughfares while employees are going to or from work unless pedestrian lanes are provided.

(a) Railroad tracks and other hazardous crossings shall be plainly posted and traffic control devices (American National Standard D8.1 - 1967 for Railroad-Highway Grade Crossing Protection) should be utilized.

(b) Restricted overhead clearance. All areas of restricted side or overhead clearance shall be plainly marked.

(c) Pickup and unloading points. Pickup and unloading points and paths for lumber packages on conveyors and transfers and other areas where accurate spotting is required, shall be plainly marked and wheel stops provided where necessary.

(d) Aisles, passageways, and roadways. Aisles, passageways, and roadways shall be sufficiently wide to provide safe side clearance. One-way aisles may be used for two-way traffic if suitable turnouts are provided.

(9) Where an operator's vision is impaired by the vehicle or load it is carrying, he shall move only on signal from someone so stationed as to have a clear view in the direction the vehicle is to travel.

(10) Lift trucks shall be equipped, maintained and operated in compliance with the requirements of the general safety and health standard, WAC 296-24-230 through 296-24-23035.

(11) Load limits. No vehicle shall be operated with loads exceeding its safe load capacity.

(12) Vehicles with internal combustion engines shall not be operated in enclosed buildings or buildings with ceilings less than sixteen feet high unless the buildings have ventilation adequate to maintain air quality as required by the general occupational health standard, chapter 296-62 WAC.

(13) Vehicles shall not be refueled while motor is running. Smoking or open flames shall not be allowed in the refueling area.

(14) No employee other than trained operators or mechanics shall start the motor of, or operate any log or lumber handling vehicle.

(15) All vehicles shall be equipped with brakes capable of holding and controlling the vehicle and capacity load upon any grade or incline over which they may operate.

(16) Unloading equipment and facilities.

(a) Machines used for hoisting, unloading, or lowering logs shall be equipped with brakes capable of controlling or holding the maximum load in midair.

(b) The lifting cylinders of all hydraulically operated log handling machines, where the load is lifted by wire rope, shall be equipped with a positive device for preventing the uncontrolled lowering of the load or forks in case of a failure in the hydraulic system.

(c) A limit switch shall be installed on powered log handling machines to prevent the lift arms from traveling too far in the event the control switch is not released in time.

(d) When forklift-type machines are used to load trailers, a means of securing the loading attachment to the fork shall be installed and used.

(e) A-frames and similar log unloading devices shall have adequate height to provide safe clearance for swinging loads and to provide for adequate crotch lines and spreader bar devices.

(f) Log handling machines used to stack logs or lift loads above operator's head shall be equipped with overhead protection.

(g) Unloading devices shall be equipped with a horn or other plainly audible signaling device.

(h) Movement of unloading equipment shall be coordinated by audible or hand signals when operator's vision is impaired or operating in the vicinity of other employees.

Lift trucks regularly used for transporting peeler blocks or cores shall have tusks or a similar type hold down device to prevent the blocks or cores from rolling off the forks.

(17) Where spinners are used on steering wheels, they shall be of the automatic retracting type or shall be built into the wheel in such a manner as not to extend above the plane surface of the wheel. Vehicles equipped with positive antikickback steering are exempted from this requirement.

(18) Mechanical stackers and unstackers shall have all gears, sprockets and chains exposed to the contact of workers, fully enclosed by guards as required by WAC 296-78-710 of this chapter.

(19) Manually operated control switches shall be properly identified and so located as to be readily accessible to the operator. Main control switches shall be so designed that they can be locked in the open position.

(20) Employees shall not stand or walk under loads being lifted or moved. Means shall be provided to positively block the hoisting platform when employees must go beneath the stacker or unstacker hoist.

(21) No person shall ride any lift truck or lumber carrier unless a suitable seat is provided, except for training purposes.

(22) Unstacking machines shall be provided with a stopping device which shall at all times be accessible to at least one employee working on the machine.

(23) Floor of unstacker shall be kept free of broken stickers and other debris. A bin or frame shall be provided to allow for an orderly storage of stickers.

(24) Drags or other approved devices shall be provided to prevent lumber from running down on graders.

(25) Liquified petroleum gas storage and handling. Storage and handling of liquified petroleum gas shall be in accordance with the requirements of WAC 296-24-475 through 296-24-47517 of the general safety and health standards.

(26) Flammable liquids. Flammable liquids shall be stored and handled in accordance with WAC 296-24-

330 through 296-24-33019 of the general safety and health standards.

(27) Guarding side openings. The hoistway side openings at the top level of the stacker and unstacker shall be protected by enclosures of standard railings.

(28) Guarding hoistway openings. When the hoist platform or top of the load is below the working platform, the hoistway openings shall be guarded.

(29) Guarding lower landing area. The lower landing area of stackers and unstackers shall be guarded by enclosures that prevent entrance to the area or pit below the hoist platform. Entrances should be protected by electrically interlocked gates which, when open, will disconnect the power and set the hoist brakes. When the interlock is not installed, other positive means of protecting the entrance shall be provided.

(30) Lumber lifting devices. Lumber lifting devices on all stackers shall be designed and arranged so as to minimize the possibility of lumber falling from such devices.

(31) Inspection. At the start of each work shift, equipment operators shall inspect the equipment they will use for evidence of failure or incipient failure. Equipment found to have defects which might affect the operating safety shall not be used until the defects are corrected.

(32) Cleaning pits. Safe means of entrance and exit shall be provided to permit cleaning of pits.

(33) Preventing entry to hazardous area. Where the return of trucks from unstacker to stacker is by mechanical power or gravity, adequate signs, warning devices, or barriers shall be erected to prevent entry into the hazardous area.

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-835, filed 8/27/81.]

#### **WAC 296-78-840 Loading, piling, storage and conveying.**

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-840, filed 8/27/81.]

**WAC 296-78-84001 Loading, piling, storage and conveying—General.** (1) Units or loads of lumber built up for transportation by overhead cranes, lift trucks, auto trucks, or manually or mechanically operated transfers shall be provided with at least one set of stickers for each eighteen inches in height of unit or load. One set of stickers shall be not more than six inches from the top of units of lumber up to three inch dimension. Where dimension of material is greater than three inches, a set of stickers shall be placed under the top layer. Stickers shall extend the full width of the package, shall be uniformly spaced, and shall be aligned one above the other. Stickers may be lapped with a minimum overlapping of twelve inches. Stickers shall not protrude more than two inches beyond the sides of the package.

(2) Lumber loading. Loads shall be built and secured to insure stability in transit.

(3) Units or loads of lumber shall not be lifted or moved until all workers are in the clear.



(4) Gradient of roll sets or roll cases over which units of lumber are to be moved shall not exceed three percent. The movement of units shall be under control at all times.

(5) Stacking of lumber in yards, either by units or in block piles, shall be conducted in a safe and orderly manner.

(6) Foundations for piling lumber in yards shall be capable of supporting the maximum applied load without tipping or sagging.

(7) The height of stacked units in storage areas shall not exceed seven of the usual four foot units, subject to the following qualifications:

(a) Units of lumber shall not be stacked more than four high unless two or more stacks of units are tied together with ties.

(b) Long units of lumber shall not be stacked upon shorter packages except where a stable pile can be made with the use of package separators.

(c) In unit package piles, substantial polsters or unit separators shall be placed between each package directly over the stickers.

(8) Wooden horses used for loading preformed loads of lumber shall be of material not less than four by six inches in cross section net measure.

(9) Unstable piles. Piles of lumber which have become unstable shall be immediately made stable or removed.

(10) Lift boards or pallets shall be loaded in such a manner as to prevent material from spilling or the material shall be secured with a binder.

(11) Packing rooms shall be kept free of debris and chutes shall be equipped with a means of slowing down the materials.

(12) Sorting chains shall be provided with a stopping device which shall at all times be readily accessible to at least one employee working on the chain.

(13) The inside of the walkway of all green chains and sorting tables shall be provided with a standard toeboard.

(14) Rollers or other devices shall be provided for removing heavy dimension lumber from the cabin or table.

(15) Roll casings and transfer tables shall be cleaned regularly and shall be kept reasonably free from debris.

(16) In all permanent installations, green chains and sorting tables shall be roofed over to provide protection from inclement weather. Normal work stations shall be provided with a drained work surface which is evenly floored of nonslip material.

(17) Power driven rolls shall be operated in a manner to prevent end collisions.

(18) The space between live rolls shall be filled in on either side of crosswalks with material of structural strength to withstand the load imposed with a four to one safety factor.

(19) The driving mechanism of live rolls shall be guarded wherever exposed to contact.

(20) Live rolls shall be replaced when their surface develops a break or hole.

(21) Guarding. Spiked live rolls shall be guarded.

(22) Ramps or skidways used to transfer lumber or materials from one level to another shall be provided

with all safeguards necessary for the protection of workers.

(23) Landings on a lower level where lumber or timbers are discharged over ramps or skidways shall be provided with a solid bumper not less than six inches in height at the outer edge. Such landing shall be maintained in good repair at all times.

(24) Ramps or skidways shall be so arranged that the person putting lumber down shall have a clear view of the lower landing. Lumber or timbers shall not be put down until all workers are in the clear.

(25)(a) The under face of all ramp or skidway landings shall be fenced off or other positive means provided to prevent persons from walking out under dropping timber.

(b) Return strands of sorting table ramp chains shall be supported by troughs of sufficient strength to support the weight of a broken chain.

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-84001, filed 8/27/81.]

**WAC 296-78-84003 Conveyors.** (1) Construction, operation, and maintenance of conveyors shall be in accordance with American National Standard B20.1 - 1957, Safety Code for Conveyors, Cableways and related equipment.

(2) Conveyor troughs in which the working strands of a conveyor operate shall be of ample dimension and strength to carry a broken chain and shall afford effective protection to all employees.

(3) When the return strand of a conveyor operates within seven feet of the floor there shall be a trough provided of sufficient strength to carry the weight resulting from a broken chain.

(4) When the return strands of a conveyor pass over passageways or work areas such guards shall be placed under them as will effectively protect workers.

(5) When the working strand of a conveyor crosses within three feet of the floor level in passageways, the trough in which it works shall be bridged the full width of the passageway.

(6) Where conveyor, idler pulleys or other equipment is located over or dangerously near burning refuse, any worker going to such location shall use a safety line which shall be securely fastened to his body and tended by a helper.

(7) Conveyors shall be provided with an emergency panic-type stopping device which can be reached by a person in a sitting position on the conveyor. Such device shall be located near the material entrance to each barker, chipper, hog, saw, or similar type of equipment except where the conveyor leading into such equipment is under constant control of an operator who has full view of the material entrance and is located or restrained where he/she cannot possibly fall onto the conveyor. The device shall stop the conveyor a sufficient distance away from the hazard to prevent injury or further injury by the hazard.

(8) Screw or auger type conveyor troughs and boxes shall be equipped with covers. If it is not practical to

cover the troughs or boxes, other equivalent type guards shall be provided.

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-84003, filed 8/27/81.]

**WAC 296-78-84005 Dry kilns.** (1) Transfer, kiln and dolly tracks shall be properly maintained at all times and shall have a grade of not more than one and one-fourth percent. Bumpers or stops shall be installed at the ends of all tracks capable of stopping a normal load for which the track is installed. A means shall be provided for chocking or blocking cars.

(2) Doors.

(a) Main kiln doors. Main kiln doors shall be provided with a method of holding them open while kiln is being loaded.

(b) Counterweights on vertical lift doors shall be boxed or otherwise guarded.

(c) Means shall be provided to firmly secure main doors, when they are disengaged from carriers and hangers, to prevent toppling.

(3) Kilns whose operation requires inside inspection shall be maintained with not less than eighteen inches clearance between loaded cars and the walls of the kiln. The requirements for personal protective equipment specified in WAC 296-24-075 through 296-24-092 shall be complied with.

(4) Kiln loads shall be equipped or arranged for easy attachment and detachment of transfer cables. Means for stopping kiln cars shall be available at all times.

(5) Cars shall not be moved until tracks are clear and workers are out of the bight of transfer lines.

(6) When kiln or dolly loads of lumber are permitted to coast through or adjacent to any work area, audible warning shall be given.

(7) Stickers shall not be allowed to protrude more than two inches from the sides of kiln stacks.

(8) Yards and storage areas shall be kept reasonably free of debris and unnecessary obstruction. Warning signs shall be conspicuously posted wherever there is danger from moving vehicles or equipment.

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-84005, filed 8/27/81.]

**WAC 296-78-84007 Chippers and logs.** (1) Chipper. The feed system to the chipper shall be arranged so the operator does not stand in direct line with the chipper spout (hopper). The chipper spout shall be enclosed to a height or distance of not less than forty inches from the floor or the operator's station. A safety belt and lifeline shall be worn by workers when working at or near the spout unless the spout is guarded. The lifeline shall be short enough to prevent workers from falling into the chipper.

(2) Hog mills shall be provided with feed chutes so designed and arranged that from no position on the rim of the chute shall the distance to the knives or feed roll be less than forty inches. Baffles shall be provided which

shall effectively prevent material from being thrown from the mill.

(3) Employees feeding hog mills shall be provided with safety belts and lines, which they shall be required to use at all times, unless otherwise protected from any possibility of falling into the mill.

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-84007, filed 8/27/81.]

**WAC 296-78-84009 Bins and bunkers.** (1) Bins, bunkers, hoppers, and fuel houses. Guarding. Open bins, bunkers, and hoppers whose upper edges extend less than three feet above working level shall be equipped with standard handrails and toeboards, or have their tops covered by a substantial grill or grating with openings small enough to prevent a person from falling through.

(2) Fuel hoppers shall be provided with doors that may be remotely operated.

(3) Fuel hoppers shall be provided with platforms with standard railings and adequately lighted for the protection of workers taking out fuel.

(4)(a) Fuel bins shall be provided with an approved railed platform or walkway near the top or other approved means, for the use of employees engaged in dislodging congested fuel. No employee shall enter any fuel bin except where adequately safeguarded.

(b) Recognizing however, the varying designs of fuel storage vaults and the type of fuel handled and certain peculiar local conditions, the adequacy of safety devices shall be determined by a duly authorized representative of the department of labor and industries, division of industrial safety and health.

(c) During operations when the flow of normal fuel is interrupted but dust from operating sanders is received in the bin, workers shall not enter the fuel bin until the flow of sander dust has been discontinued and the dust has settled.

(d) Use of wheeled equipment to load bins. Where automotive or other wheeled equipment is used to move materials into bins, bunkers, and hoppers, adequate guard rails shall be installed along each side of the runway, and a substantial bumper stop provided when necessary.

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-84009, filed 8/27/81.]

**WAC 296-78-84011 Burners.** (1) Burners and smoke stacks other than the self-supporting type shall be adequately guyed. Buckle guys shall be installed if burner or stack is more than fifty feet in height.

(2) Runway. The conveyor runway to the burner shall be equipped with a standard handrail. If the runway crosses a roadway or thoroughfare, standard toeboards shall be provided in addition.

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-84011, filed 8/27/81.]

## Chapter 296-79 WAC

## SAFETY STANDARDS FOR PULP, PAPER, AND PAPERBOARD MILLS AND CONVERTERS

## WAC

296-79-010	Scope and application.
296-79-020	General requirements.
296-79-030	Guards and guarding.
296-79-040	Fire protection and ignition sources.
296-79-050	Personal protection.
296-79-060	Protection from radiation.
296-79-070	Illumination.
296-79-080	Elevators, manlifts and other lifting devices.
296-79-090	Electrical equipment and distribution.
296-79-100	Floors, platforms, stairways, ladders, loading docks.
296-79-110	Elevated runways and ramps used by vehicles.
296-79-120	Scaffolds, construction, use and maintenance.
296-79-130	Crossovers, aisles, passages.
296-79-140	Installation, inspection, and maintenance of pipes, piping systems, and hoses.
296-79-150	Mobile equipment and lift trucks.
296-79-160	Requirements for cranes and hoists—General safety and health standards to prevail.
296-79-170	Requirements for crawler and truck cranes.
296-79-180	Privately owned standard gauge railroad operations.
296-79-190	Loading and unloading materials from railway cars or trucks.
296-79-200	Bridge and dock plates.
296-79-210	Belt, chain and roller type conveyors, maintenance and inspection.
296-79-220	Deactivating and lockout requirements.
296-79-230	Vessel or confined area requirements.
296-79-240	Storage of fuel, oil, flammables and chemicals.
296-79-250	Safety procedure for handling dry sulfur.
296-79-255	Safety procedure for handling liquid sulfur.
296-79-260	Pulpwood storage and handling.
296-79-270	Pulpwood preparation—Scope and application.
296-79-27001	Barkers, chippers, and hog feed devices.
296-79-27003	Log hauls, slips, and carriages.
296-79-27005	Band saws.
296-79-27007	Circular saws speeds and repairs.
296-79-27009	Slasher saws—tables.
296-79-27011	Circular swing saws.
296-79-27013	Drag saws—Fixed chain saws—Circular cut-off saws.
296-79-27015	Construction and use of pulpwood splitters.
296-79-280	Chip and hog fuel storage.
296-79-290	Stock preparation and reprocessing—Scope and application.
296-79-29001	Digester valves and piping.
296-79-29003	Warning of digester being blown.
296-79-29005	Unplugging quick lime stoppages.
296-79-29007	Bleach plant.
296-79-29009	Audible alarm in bleach plant.
296-79-29011	Pocket grinder doors.
296-79-29013	Pulping device procedures.
296-79-29015	Off machine repulping devices.
296-79-29017	Pulping device cleaning, inspection and repairing.
296-79-29019	Guarding hand knives and sharpening steels.
296-79-29021	Shredders and blowers.
296-79-29023	Clearing shredder jams.
296-79-29025	Repairing shredders.
296-79-29027	Guillotine type roll splitters.
296-79-29029	Broke hole.
296-79-29031	Industrial kiln guns and ammunition.
296-79-29033	Chlorine dioxide system.
296-79-29035	Piling and unpling pulp.
296-79-29037	Chocking rolls.
296-79-300	Machine room equipment and procedures.
296-79-310	Converting operations (bag and container manufacturing, printing, coating, finishing and related processes)—Scope and application.
296-79-31001	General requirements.
296-79-31003	Corrugator.
296-79-31005	Adhesive system.

296-79-31007	Printing and cutting.
296-79-31009	Die cutting.
296-79-31011	Power lifts on gluers, tapers and stitchers.
296-79-31013	Strapping—banding operations.
296-79-320	Recovery furnace area requirements.

**WAC 296-79-010 Scope and application.** (1) This chapter applies to establishments, firms, persons and corporations dealing with the manufacturing, processing, storing, finishing or converting of pulp, paper or paperboard and all buildings, machinery and equipment pertaining thereto.

(2) This chapter shall augment the Washington state general safety and health standards, general occupational health standards, electrical workers safety rules, and any other standards which are applicable to all industries governed by chapter 80, Laws of 1973 (chapter 49.17 RCW), Washington Industrial Safety and Health Act. In the event of any conflict between any portion of this chapter and any portion of any of the general application standards, the provisions of this chapter 296-79 WAC, shall apply.

(3) When the words "shall" or "must" are used in this chapter, the requirement is compulsory. The words "may" or "should," as used in this standard, identify recommendations or suggestions only.

(4) The rules contained in this chapter are minimum requirements and the use of additional guards, or other means, methods or procedures may be needed in order to make the work or place of work safe.

[Order 74-24, § 296-79-010, filed 5/6/74; Order 70-6, § 296-79-010, filed 7/10/70, effective 8/10/70.]

**WAC 296-79-020 General requirements.** (1) Housekeeping. Floors shall be kept reasonably clear of spilled or leaking oil, grease, water, broke, etc., that may cause slipping, tripping or falling. Nonskid type surfacing shall be installed in vehicular or pedestrian traffic areas in which slipping hazards otherwise would exist.

In areas where it is not possible to keep the floor free of materials which cause a slipping hazard, mats, cleats, or other suitable materials which will effectively minimize or eliminate the hazard shall be installed.

(2) Storage of hoses, cords, slings or similar items or equipment. Hoses, cords, slings or similar items or equipment shall be stored in such a manner that they will not create a hazard.

(3) Storage and transportation of materials. Materials, objects or equipment shall be stored or transported by use of means or methods which will prevent them from falling, tipping or rolling.

(4) Compressed gas cylinders. Compressed gas cylinders shall be stored away from heat sources, combustible materials or other materials which may cause hazardous conditions. Storage facilities shall comply with the requirements of the general safety and health standards, chapter 296-24 WAC. Cylinders shall be secured in a manner which will prevent them from tipping or falling. Acetylene cylinders shall be stored, transported, or used while in the upright position only.

(5) Warning of obstructions. Open manholes or excavations shall be roped off, barricaded, or adequately

safeguarded by an approved method when located in or adjacent to walkways, aiseways, or roadways. During periods of darkness or reduced visibility, such areas shall be provided with warning lights or lanterns.

(6) Employees to be instructed. Employees shall not be permitted to operate any machine or equipment until they have received proper instruction and are familiar with safe operating procedures.

(7) Training personnel to handle emergencies. In each area where hazardous substances may be encountered, personnel shall be trained to cope with emergencies arising from breaks, ruptures, or spills which would create a hazardous condition.

(8) Working alone. When an employee is assigned to work alone in a remote or isolated area, a system shall be instituted whereby such employee reports by use of radio or telephone to someone periodically or a designated person shall check on his safety at reasonable intervals. All persons involved in working alone shall be advised of the procedures to be followed.

(9) Lifting or moving objects. Employees shall be instructed in proper lifting or moving techniques and methods. Mechanical devices should be used or employees should ask for assistance in lifting or moving heavy objects.

(10) Reporting hazards. Any faulty equipment or hazardous condition shall be promptly reported to the person in charge.

(11) Exits from hazardous areas. Where physically and reasonably possible, there shall be at least two unobstructed exits from any hazardous area. Such exits shall preferably be on opposite walls.

(12) Safe work area. Sufficient clearance shall be maintained between machines to allow employees a safe work area.

(13) Protection from overhead hazard. Warning signs shall be placed in conspicuous locations below areas where overhead work is being done and shall be removed promptly when work is completed.

(14) Welding areas protected. Areas in which welding is being done shall be screened or barricaded to protect persons from flash burns, when practical. If the welding process cannot be isolated, all persons who may be exposed to the hazard of arc flash shall be properly protected.

(15) Testing safety devices. Brakes, back stops, anti-runaway devices, overload releases and other safety devices shall be inspected and tested frequently to ensure that all are operative and maintained in good repair.

(16) Starting and stopping devices. Electrically or manually operated power disconnecting devices shall be provided within easy reach of the operator while in his normal operating position. If necessary for safety of the operation, the machine shall be so equipped that retarding or braking action can be applied at the time of or after the source of power is deactivated.

(17) Use of compressed air for cleaning purposes. Compressed air shall not be used for cleaning purposes if it may endanger other persons in the area or for cleaning clothing while it is being worn.

(18) Coupling high pressure air hoses. Sections of high pressure air hoses shall be properly coupled and have safety chains or equivalent safety device attached between the sections (30 psi or more is high pressure air).

(19) Punch bars. Open pipes shall not be used as punch bars if the use would create a hazard.

(20) Saw table limit stop or extension. Employees shall be protected from contact with the front edge of a circular saw by a limit stop which will prevent the forward swing of the cutting edge from extending beyond the edge of the table or a table extension shall be installed.

(21) Explosive-actuated tools. Explosive-actuated tool design, construction, operation and use shall comply with all requirements specified in "safety requirements for powder actuated fastening systems," adopted by the department of labor and industries. In addition, after using such tools a careful check shall be made in order to ascertain that no cartridges or charges are left where they could enter equipment or be accidentally discharged in any area where they could create a fire or explosion hazard.

(22) Approved life buoys. Where work is being performed on docks or adjacent to open water five feet or more in depth U.S. Coast Guard approved life buoys shall be provided. Such life buoys shall have sufficient line attached and be spaced at intervals not exceeding 200 feet.

(23) Ladders required on waterfront docks. Either permanent ladders or portable ladders which are readily available for emergency use shall be provided on all waterfront docks. Such ladders shall extend from the face of the dock to the water line at its lowest elevation. Spacing between ladder installations shall not exceed 400 feet. The dock area immediately adjacent to ladder locations shall be painted with a bright color which contrasts with the surrounding area. A suitable method shall be used to secure the ladders.

(24) Protection from hot pipes. All exposed hot pipes within seven feet of the floor or working platform, or within 15" measured horizontally from stairways, ramps or fixed ladders, shall be covered with an insulating material or be guarded in such a manner as to prevent contact.

(25) Prevent overhang while removing materials. Extreme care shall be taken to prevent material from creating an overhang while removing the materials from piles or bins.

(26) Establishments subject to chapter 296-79 WAC shall comply with the following standards of the American National Standards Institute:

(a) ANSI Z33.1-1961, Installation of Blower and Exhaust Systems for Dust, Stock and Vapor Removal or Conveying;

(b) ANSI B56.1-1969, Safety Standard for Powered Industrial Trucks.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 82-13-045 (Order 82-22), § 296-79-020, filed 6/11/82; Order 77-12, § 296-79-020, filed 7/11/77; Order 74-24, § 296-79-020, filed 5/6/74; Order 70-6, § 296-79-020, filed 7/10/70, effective 8/10/70.]

**WAC 296-79-030 Guards and guarding.** (1) General safety and health standards to prevail where applicable. Driving mechanisms, power transmission equipment or apparatus, prime movers, shear or pinch points or other similar hazardous areas of exposure shall be properly safeguarded with standard safeguards as required by the general safety and health standards.

(2) Safeguarding specific areas, machines or conditions. To augment the general safeguarding requirements contained in the previous rule, certain equipment, tools, machines, and areas present definite hazards and shall be safeguarded by compliance with the following requirements:

(a) Conveyors. Hazardous areas of conveyors shall be adequately safeguarded or workers shall be protected from hazard by other effective means.

(b) Broke shredders. Cutting heads shall be completely enclosed except for opening at feed side sufficient only to permit entry of stock. The enclosure shall be bolted or locked in place and shall be of solid material or with mesh or other openings not exceeding 1/2 inch.

(c) Sharp edged slitter knives. Sharp edged slitter knives subject to accidental contact shall be effectively guarded. Carriers shall be provided and used when transporting or carrying sharp edged slitter knives.

(d) Wheels of traveling sections of conveyors. Traveling sections of conveyors and other equipment with wheels which run on rails or guides, other than railroad equipment, shall be provided with wheel sweep guards installed in front of the traveling wheels in all areas where persons may be exposed to contact. Sweep guards shall have not greater than 1/4 inch clearance above the rail or guide.

(e) Stitching or sewing machine. Carton or bag stitching machines shall be properly safeguarded to prevent persons from coming in contact with the stitching head and other pinch or nip points.

(f) Beaters and pulpers. Where the top edge of vessels or tubs is less than standard height guardrails above the floor or operator's platform, a guardrail of standard height shall be installed. If necessary for the protection of the person feeding equipment, an intermediate guardrail or other suitable protection shall be installed. Beater rolls shall be provided with covers.

(g) First dryer. A permanent guard or apron guard, or both, shall be installed to protect workers from any exposed ingoing nip of the first dryer drum in each section if the area is accessible to workers while the dryer is in operation.

(h) Floor and drain openings. Floor and drain openings in walkways and general work areas shall be covered with material or gratings with openings no larger than 2" in the narrow dimension.

(i) Mechanical devices to dump chip cars, trucks or trailers. When using mechanical equipment to elevate the front end of the chip containers for dumping into a hopper, the shear area between the floor and the elevated section shall be safeguarded. The pit area shall be adequately safeguarded or barricaded. Safeguards shall be installed around the exposed sides of a chip hopper.

(3) Replacing guards. All permanent guards must be replaced or adequate temporary safeguards provided before a machine is put into operation.

(4) Protection from moving materials. When material, such as chunks, slivers, cants, or logs could be thrown or flipped by a saw, barker, or other machines, adequate barricades, screens, netting, or other safeguards shall be provided and maintained.

(5) Circular saws (not slasher saws). Saws shall be provided with standard guards, in accordance with American National Standard 01.1-1954 (reaffirmed 1961).

(6) Protection for areas where guards are impractical. Where normal guarding is impractical the hazard shall be reduced to a minimum by use of safety chains, lifelines, signs or other reasonable means. Areas which present a major physical hazard which cannot be reasonably safeguarded shall be identified by use of paint or other materials.

(7) Transporting knives. Knives used for chip or hog fuel machines, or guillotine cutters, shall be secured in properly constructed containers during transportation.

(8) Hand knife or scissors. Workers shall be furnished properly designed and constructed sheaths for safely carrying knives and scissors used for cutting or trimming pulp and paper.

(9) Safe storage for knives and scissors. Tables where paper is being cut shall be equipped with sheaths or shelves for safe storage of knives and scissors.

(10) Safeguard for foot operated treadle switch used to activate power driven equipment. Foot operated treadle switches used for activation of power driven equipment shall be protected by a stirrup type guard or equivalent protection shall be provided to prevent accidental activation.

(11) Automatic pressure actuated stopping devices. Hand fed machines and other moving equipment which create shear or pinch points which cannot be reasonably guarded may be safeguarded by the installation of pressure activated bars or sensing devices which, when contacted, will automatically stop the machine or equipment.

[Order 74-24, § 296-79-030, filed 5/6/74; Order 70-6, § 296-79-030, filed 7/10/70, effective 8/10/70.]

**WAC 296-79-040 Fire protection and ignition sources.** (1) Portable fire extinguishers. Portable fire extinguishers shall be constructed, tested, maintained, and used in accordance with the recommendations specified by the National Fire Protection Association or other similar recognized agencies.

(2) Suitable fire extinguishing equipment. Fire extinguishing equipment suitable for use for the type or types of fire which could be expected in an area shall be provided.

(3) Vaporizing liquid type extinguishers. Vaporizing liquid type extinguishers shall not be used if known to create a condition which is hazardous to health.

(4) Proper type of fire extinguisher to be used. Each person who is expected or required to use fire extinguishing equipment shall be instructed as to the proper

type or types of extinguishing equipment to be used for each class of fire.

(5) Fire drills, etc. Personnel shall be instructed on procedures to be followed in case of fire.

(6) Posting areas where fire or explosion hazards exist. Areas where a fire or explosion hazard exists shall be posted with NO SMOKING or other suitable signs which would indicate that such hazard exists.

(7) Sources of ignition prohibited in hazardous areas. Spark-producing tools, lights or other sources of ignition shall not be used in any area where the hazard of explosion exists.

(8) Welding and burning permits. A written welding or burning permit shall be secured from a delegated person when welding and burning is to be done in an area near flammable or combustible materials or in areas where a potentially explosive condition exists. Permits shall not be valid for more than 24 hours.

(9) Internal dust fires in or around gas hoods. A safe written procedure shall be developed by the company for control of dust fires in or around gas hoods. Personnel shall be properly instructed and trained in this procedure.

[Order 74-24, § 296-79-040, filed 5/6/74; Order 70-6, § 296-79-040, filed 7/10/70, effective 8/10/70.]

**WAC 296-79-050 Personal protection.** (1) Personal protective equipment and clothing. Personal protective clothing and equipment as required by the general safety and health standards and the general occupational health standards shall be furnished by the employer and worn or used by the employee when needed to eliminate or minimize the degree of hazard involved with any specific operation.

(a) Required clothing, caps, etc. Employees shall wear sufficient clothing to protect them from hazards to which they may be exposed while performing their duties. Consideration must be given to temperatures in certain areas in which persons work. Employees whose hair is long enough to be caught in machinery or equipment around which they work shall wear caps, hair nets or other protection which will adequately confine the hair while performing their duties.

Rings or other jewelry which could create a hazard should not be worn by employees while in the performance of their work.

(b) Protective footwear. Employees who work in areas where there is a possibility of foot injury due to falling or rolling objects shall wear safety type footwear. Shoe guards and toe protectors will be supplied by management. Management shall also make safety shoes available for purchase by employees at not more than actual cost to management.

Calks or other suitable footwear which will afford reasonable protection from slipping shall be worn while working on logs. Calk boots shall be made available at cost.

(2) Working over or near water.

(a) Employees working over or near water who are exposed to the danger of drowning shall be provided

with and shall wear U.S. Coast Guard approved personal flotation devices.

Note: The following exceptions will apply:

- (i) When water is known to be chest-deep or less on the exposed worker(s);
- (ii) When the employee is protected by standard guardrails;
- (iii) When the employee is protected by a safety belt or lanyard; or
- (iv) When the employee is within the confines of the cabin of a boat or other equivalent enclosure.

(b) Prior to and after each use, buoyant work devices shall be inspected for defects which would alter their strength or buoyancy. Defective units shall not be used.

(3) Protection from noise. The hearing protection requirements of the general occupational health standards, chapter 296-62 WAC, shall apply.

(4) Respiratory protection. The respiratory protection requirements of the general occupational health standards, chapter 296-62 WAC, shall apply.

[Statutory Authority: Chapter 49.17 RCW. 89-11-035 (Order 89-03), § 296-79-050, filed 5/15/89, effective 6/30/89. Statutory Authority: RCW 49.17.040 and 49.17.050. 83-24-013 (Order 83-34), § 296-79-050, filed 11/30/83; 82-13-045 (Order 82-22), § 296-79-050, filed 6/11/82; Order 74-24, § 296-79-050, filed 5/6/74; Order 70-6, § 296-79-050, filed 7/10/70, effective 8/10/70.]

**WAC 296-79-060 Protection from radiation.** Special rules and regulations regarding the use of ionizing radiation shall be posted and followed as required by the atomic energy commission or the appropriate state agency, whichever has authority. For protection from other types of radiation, the rules contained in the general occupational health standards, chapter 296-62 WAC, shall prevail.

[Order 74-24, § 296-79-060, filed 5/6/74; Order 70-6, § 296-79-060, filed 7/10/70, effective 8/10/70.]

**WAC 296-79-070 Illumination.** (1) Sufficient illumination required. All areas shall be sufficiently illuminated in order that persons in the area can safely perform their assigned duties. The recommended levels of illumination specified in the general occupational health standards shall be followed where applicable. When areas are not specifically referred to in the general occupational health standards and the adequacy of illumination for the area or task performed is questionable, a determination of the amount of illumination needed shall be made by the industrial hygiene section of the division of industrial safety and health.

(2) Emergency or secondary lighting system required.

(a) There shall be an emergency or secondary lighting system which can be actuated immediately upon failure of the normal power supply system. The emergency or secondary lighting system shall provide illumination in the following areas:

(i) Wherever it is necessary for workers to remain at their machine or station to shut down equipment in case of power failure.

(ii) At stairways and passageways or aiseways used by workers as an emergency exit in case of power failure.

(iii) In all plant first aid and/or medical facilities.



(b) Emergency lighting facilities shall be checked at least every 30 days for mechanical defects. Defective equipment shall be given priority for repair schedule.

(3) Extension cord type lights. All extension cord type lights shall be provided with proper guards.

[Order 74-24, § 296-79-070, filed 5/6/74; Order 70-6, § 296-79-070, filed 7/10/70, effective 8/10/70.]

**WAC 296-79-080 Elevators, manlifts and other lifting devices.** (1) Elevators, manlifts, etc. All elevators, manlifts or other lifting devices shall be installed and maintained in conformity with the requirements specified in the Washington state elevator laws and regulations adopted by the elevator section of the division of building and construction safety inspection, department of labor and industries.

(2) Inspection of elevators, etc., for acid towers. Outside elevators shall be inspected daily during winter months when ice materially affects safety. Elevators, runways, stairs, etc., for acid towers shall be inspected monthly for defects that may occur because of exposure to acid or corrosive gases.

(3) Gas masks on elevators. Elevators located in areas where exposure to potentially harmful concentrations of toxic substances may occur shall be equipped with an adequate supply of gas masks to protect the maximum number of passengers.

(4) Posting elevators. Elevators shall be posted indicating the maximum number of persons allowed to ride.

[Order 74-24, § 296-79-080, filed 5/6/74; Order 70-6, § 296-79-080, filed 7/10/70, effective 8/10/70.]

**WAC 296-79-090 Electrical equipment and distribution.** (1) National electrical code to prevail. All electrical installations and electrical utilization equipment shall comply with the National Electrical Code requirements.

(2) Authorized personnel to do electrical work. Only those persons who are qualified to do the work assigned and are authorized by the employer shall be allowed to perform electrical work on any electrical equipment or wiring installations.

(3) High voltage areas to be guarded. Motor rooms, switch panel rooms or other areas where persons may come in contact with high voltages shall be fenced off or be enclosed in a separate area. The gate, door or access to such area shall be posted with a notice stating that only authorized persons are allowed in the area.

(4) Control panels. Floor stand panels should be protected from being struck by moving equipment and handles and buttons shall be protected from accidental actuation.

(5) Switches or control devices. Switches, circuit breakers or other control devices shall be so located that they are readily accessible for activation or deactivation and shall be marked to indicate their function or machine which they control. The positions of ON and OFF shall be marked or indicated and provision shall be made for locking or tagging out the circuit.

(6) Starting requirements for electrically driven equipment after power failure. Electrically driven equipment shall be so designed that it will not automatically start upon restoration of power after a power failure if it will create a hazard to personnel.

(7) Posting equipment automatically activated or remotely controlled. Equipment which is automatically activated or remotely controlled shall be posted, warning persons that machine may start automatically if it will create a hazard to personnel.

[Order 74-24, § 296-79-090, filed 5/6/74; Order 70-6, § 296-79-090, filed 7/10/70, effective 8/10/70.]

**WAC 296-79-100 Floors, platforms, stairways, ladders, loading docks.** (1) Construction and maintenance. Floors, platforms, stairways, ladders, and loading docks shall be constructed, maintained and used in accordance with the requirements specified in the general safety and health standards and shall have nonskid type surfaces where needed to minimize the hazard of slipping.

[Order 74-24, § 296-79-100, filed 5/6/74; Order 70-6, § 296-79-100, filed 7/10/70, effective 8/10/70.]

**WAC 296-79-110 Elevated runways and ramps used by vehicles.** (1) Elevated runway and ramp construction. Elevated runways or ramps shall be constructed to safely support four times the weight of any load to which it may be subjected. Runways and ramps shall be cleated, grooved, rough surfaced, or covered with a material which will minimize the danger of skidding. The maximum inclination of a ramp used for wheeled equipment shall not exceed 20° from horizontal.

(2) Guarding exposed sides. Elevated ramps or runways used for the travel of wheeled equipment shall have exposed sides guarded with a substantial bull rail or shear rail of sufficient height to prevent wheeled equipment from going over the rail. Standard guardrails shall be installed on runways wherever the height exceeds 4 feet above the adjacent area except where used for loading or unloading purposes.

[Order 74-24, § 296-79-110, filed 5/6/74; Order 70-6, § 296-79-110, filed 7/10/70, effective 8/10/70.]

**WAC 296-79-120 Scaffolds, construction, use and maintenance.** Whenever work must be performed at a height which cannot be reached from the floor or permanent platform and where it would not be safe practice to use a ladder, a properly constructed scaffold shall be provided and used. All scaffolds shall have a factor of safety of four times any load to which they may be subjected and be adequately secured or stabilized to prevent tipping. Scaffolds shall be constructed in accordance with acceptable engineering practices and shall be maintained in a safe condition. Tools or materials which would create a tripping hazard or which may fall from the platform shall be secured or removed. Persons shall not ride on a roller scaffold while it is being moved.

[Order 74-24, § 296-79-120, filed 5/6/74; Order 70-6, § 296-79-120, filed 7/10/70, effective 8/10/70.]



**WAC 296-79-130 Crossovers, aisles, passages.** (1) Crossing conveyors. Where access is required, crossovers or underpasses with proper safeguards shall be provided over or under all conveyors.

(2) Clearances to be marked. Low clearance areas under conveyors which could present a hazard to mobile equipment operations shall be identified by a suitable means, such as signs, contrasting colors, or tell-tales.

(3) Aisles or passageways. Aisles or passageways should be at least three feet wider than the widest vehicle or load traveling the aisle or passageway. When this clearance cannot be maintained, adequate precautions shall be taken.

(4) Crossovers over obstructions in passageways. Crossovers shall be provided where employees are required to cross over transmission drive lines or other permanent obstructions in passageways or walkways.

[Order 74-24, § 296-79-130, filed 5/6/74; Order 70-6, § 296-79-130, filed 7/10/70, effective 8/10/70.]

**WAC 296-79-140 Installation, inspection, and maintenance of pipes, piping systems, and hoses.** (1) Definitions applicable to this section.

(a) Hazardous material system – any system within the following classifications:

(i) Flammable or explosive – any system containing materials which are hazardous because they are easily ignited and create a fire or explosion hazard, defined by NFPA as Class I liquids;

(ii) Chemically active or toxic – any system containing material which offers corrosion or toxic hazard in itself or can be productive of harmful gases upon release, defined by NFPA 704M as Class 3 and 4 materials;

(iii) Thermally hazardous – any system above 130°F which exposes persons to potential thermal burns;

(iv) Pressurized – any gaseous system above 200 psig or liquid system above 500 psig.

(b) Piping system – any fixed piping, either rigid pipe or flexible hose, including all fittings and valves, in either permanent or temporary application.

(2) Design and installation. All new piping systems intended to be used in hazardous material service shall be designed and installed in accordance with applicable provisions of the ASME Code for Pressure Piping or in accordance with applicable provisions of ANSI B31.1 through B31.8. The referenced edition in effect at the time of installation shall be utilized.

Note: Both referenced standards have identical requirements.

(3) Inspection and maintenance.

(a) Management shall develop a formal program of inspections for all hazardous material piping systems. The program shall be based on sound maintenance engineering principle and shall demonstrate due consideration for the manufacturing specifications of the pipe, hose, valves and fittings, the ambient environment of the installation and the corrosive or abrasive effect of the material handled within the system.

(b) Type and frequency of tests and/or inspections and selection of inspection sites shall be adequate to give

indications that minimum safe design operating tolerances are maintained. The tests may include visual or nondestructive methods.

(c) All companies shall submit their formal program of initial and ongoing inspections to the department for approval within one year after the effective date of this requirement.

(d) All existing hazardous material systems shall be inspected to the criteria of this section prior to two years after effective date, or in accordance with a schedule approved by the department.

(4) Inspection records.

(a) Results of inspections and/or tests shall be maintained as a record for each system.

(b) Past records may be discarded provided the current inspection report and the immediately preceding two reports are maintained.

(c) When a system is replaced, a new record shall be established and all past records may be discarded.

(d) The records for each system shall be made available for review by the department upon request.

(e) Portions of systems that are buried or enclosed in permanent structures in such a manner as to prevent exposure to employees even in the event of a failure, may be exempted from the inspection requirements only.

(5) Systems or sections of systems found to be below the minimum design criteria requirements for the current service shall be repaired or replaced with component parts and methods which equal the requirements for new installations.

(6) Identification of piping systems.

(a) Pipes containing hazardous materials shall be identified. It is recommended that USAS A13.1 "Scheme for Identification of Piping Systems" be followed.

(b) Positive identification of a piping system content shall be lettered legend giving the name of the content in full or abbreviated form, or a commonly used identification system. Such identification shall be made and maintained at suitable intervals and at valves, fittings, and on both sides of walls or floors as needed. Arrows may be used to indicate the direction of flow. Where it is desirable or necessary to give supplementary information such as hazard of use of the piping system content, this may be done by additional legend or by color applied to the entire piping system or as colored bands. Legends may be placed on colored bands.

Examples of legend which may give both positive identification and supplementary information regarding hazards or use are:

Ammonia .....	Hazardous liquid or gas
Chlorine .....	Hazardous liquid or gas
Chlorine dioxide .....	Hazardous liquid or gas
Sulphur dioxide .....	Hazardous gas
Liquid caustic .....	Hazardous liquid
Liquid sulphur .....	Hazardous liquid
Sulphuric acid .....	Hazardous liquid
Sodium chlorate .....	When dry, danger of fire or explosion

Note: Manual L-1, published by Chemical Manufacturers Association, Inc., is a valuable guide in respect to supplementary legend.

(c) When color, applied to the entire piping system or as colored bands, is used to give supplementary information it should conform to the following:

CLASSIFICATION	PREDOMINANT COLOR
F—Fire-protection equipment .....	Red
D—Dangerous materials .....	Yellow (or orange)
S—Safe materials .....	Green (or the achromatic colors, white, black, gray or aluminum)
and, when required,	
P—Protective materials .....	Bright blue

(d) Legend boards showing the color and identification scheme in use shall be prominently displayed at each plant. They shall be located so that employees who may be exposed to hazardous material piping systems will have a frequent reminder of the identification program.

(e) All employees who work in the area of hazardous material piping systems shall be given training in the color and identification scheme in use.

(7) Test holes not to be covered. Test holes in blow lines of piping systems shall not be covered with insulation or other materials.

(8) Steam hoses. Steam hoses shall be specifically designed to safely carry steam at any pressures to which they may be subjected.

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-13-053 (Order 81-9), § 296-79-140, filed 6/17/81. Statutory Authority: RCW 49.17.040, 49.17.240, and chapters 43.22 and 42.30 RCW. 81-03-007 (Order 80-31), § 296-79-140, filed 1/8/81; Order 74-24, § 296-79-140, filed 5/6/74; Order 70-6, § 296-79-140, filed 7/10/70, effective 8/10/70.]

**WAC 296-79-150 Mobile equipment and lift trucks.**

(1) All industrial powered trucks should be engineered, designed, constructed, maintained and used in accordance with the recommendations specified in USAS B56.1-1969 "Safety Code for Powered Industrial Trucks."

(2) Operator training. Methods shall be devised by management to train personnel in the safe operation of powered industrial trucks and only trained and authorized operators shall be permitted to operate such vehicles.

(3) Special duties of operator. Special duties of the operator of a power-driven vehicle shall include the following:

(a) To test brakes, steering gear, lights, horns, warning devices, clutches, etc., before operating vehicle;

(b) Not to move a vehicle while an unauthorized rider is on his vehicle;

(c) To slow down and sound horn upon approaching blind corners or other places where vision or clearance is limited;

(d) To comply with all speed and traffic regulations and other applicable rules;

(e) To have the vehicle he operates under control at all times so that he can safely stop the vehicle in case of emergency; and

(f) When driving a fork lift vehicle on a grade, the load shall be kept on the upgrade side.

(4) Operator to be in proper position. Control levers of lift trucks, front end loaders, or similar types of equipment shall not be operated except when the operator is in his proper operating position.

(a) No person shall be permitted to ride on a powered hand truck unless it is so designed by the manufacturer. A limit switch shall be on operating handle—30 degrees each way from a 45-degree angle up and down.

(b) When a powered industrial truck is left unattended, load engaging means shall be fully lowered, controls shall be neutralized, power shall be shut off, and brakes set. Wheels shall be blocked if the truck is parked on an incline.

(c) A powered industrial truck is unattended when the operator is 25 feet or more away from the vehicle which remains in his view, or whenever the operator leaves the vehicle and it is not in his view.

(d) When the operator of an industrial truck is dismounted and within 25 feet of the truck still in his view, the load engaging means shall be fully lowered, controls neutralized, and the brakes set to prevent movement.

(5) Raised equipment to be blocked. Employees shall not work below the raised bed of a dump truck, raised buckets of front end loaders, raised blades of tractors or in similar positions without blocking the equipment in a manner that will prevent it from falling. When working under equipment suspended by use of jacks, safety stands or blocking shall also be used in conjunction with the jack.

(6) Precautions to be taken while inflating tire. Unmounted split rim wheels shall be placed in a safety cage or other device shall be used which will prevent a split rim from striking the worker if it should dislodge while the tire is being inflated.

(7) Reporting suspected defects. If, in the opinion of the operator, a power-driven vehicle is unsafe, the operator shall report the suspected defect immediately to the person in charge. Any defect which would make the vehicle unsafe to operate under existing conditions shall be cause to take the vehicle out of service and it shall not be put back into use until it has been made safe.

(8) Safe speed. Vehicles shall not be driven faster than a safe speed which is compatible with existing conditions.

(9) Unobstructed view. Vehicle operators shall have a reasonably unobstructed view of the direction of travel, or, where this is not possible, the operator shall be directed by a person or by a safe guidance means or device.

Where practical, mirrors shall be installed at blind corners or intersections which will allow operators to observe oncoming traffic.

It is recommended that vehicles operating in congested areas should be provided with an audible or visual alarm system.

(10) Passengers to ride properly. Passengers shall not be permitted to ride with legs or arms extending outside any vehicle nor shall they be permitted to ride unless a passenger seat or other protective device is provided.

- (11) Horns and lights.
- (a) Each vehicle shall be provided with a horn.
- (b) Any vehicle required to travel away from an illuminated area shall be equipped with a light or lights which adequately illuminate the direction of travel.
- (12) Guard on operator's platform. Every power truck operated from an end platform or standing position shall be equipped with a platform extending beyond the operator's position, strong enough to withstand a compression load equal to the weight of the loaded vehicle applied along the longitudinal axis of the truck with the outermost projection of the platform against the flat vertical surface.
- (13) Brakes on power-driven vehicles. Vehicles shall be equipped with brakes and devices which will hold a parked vehicle with load on any grade on which it may be used. The brakes and parking devices shall be kept in proper operating condition at all times.
- (14) Cleaning vehicles. All vehicles shall be kept free of excessive accumulations of dust and grease that may present a hazard.
- (15) Moving vehicles. Vehicles shall be controlled manually while being pushed or towed except when a tow bar is used. Special precautions shall be taken when pushing vehicles where view is obstructed. Pushing of vehicles or railroad cars with the forks or clamps of a lift truck is prohibited.
- (16) Prohibited forms of riding. Riding on tongue or handles of trailers or forks of vehicles is prohibited.
- (17) Jumping on or off moving vehicles. Jumping on or off moving vehicles is prohibited.
- (18) Traffic lanes, designation and systems. Regular traffic lanes should be established and clearly designated and followed whenever practical. A one-way traffic system should be employed if practical.
- (19) Clear lanes. Traffic lanes being used by pedestrians or equipment shall be kept clear of dunnage, pallets, etc., and equipment not in use.
- (20) Lifting capacity of vehicle to be observed. At no time shall a load in excess of the manufacturer's maximum lifting capacity rating be lifted, carried, or moved by a lift truck. Such lifting capacity can be altered with the approval of the equipment manufacturer.
- (21) Posting rated capacity. The maximum rated lifting capacity of all lift trucks shall at all times be posted on the vehicle in such a manner that it is readily visible to the operator.
- (22) Carrying loose material. Lift trucks shall not be used to carry loose loads of pipe, steel, iron, lumber, palletized material, rolls of paper, or barrels unless adequate clearance is provided and the loads are stabilized.
- (23) Position of lift forks or clamps. The forks or clamps of lift trucks shall be kept as low as possible while the vehicle is moving. They shall be lowered to the floor when the vehicle is parked.
- (24) Walking under loads prohibited. No person shall be allowed under the raised load of a lift truck.
- (25) Hoisting of personnel on vehicle forks prohibited. Personnel shall not be hoisted by standing directly on the forks of vehicles.
- (26) Using forklifts as elevated work platforms. A platform or structure built specifically for hoisting persons may be used providing the following requirements are complied with:
- (a) The structure must be securely attached to the forks and shall have standard guardrails and toeboards installed on all sides.
- (b) The hydraulic system shall be so designed that the lift mechanism will not drop faster than 135 feet per minute in the event of a failure in any part of the system. Forklifts used for elevating work platforms shall be identified that they are so designed.
- (c) A safety strap shall be installed or the control lever shall be locked to prevent the boom from tilting.
- (d) An operator shall attend the lift equipment while workers are on the platform.
- (e) The operator shall be in the normal operating position while raising or lowering the platform.
- (f) The vehicle shall not travel from point to point while workers are on the platform except that inching or maneuvering at very slow speed is permissible.
- (g) The area between workers on the platform and the mast shall be adequately guarded to prevent contact with chains or other shear points.
- (27) Overhead guards on lift trucks. All lift trucks shall be equipped with an overhead guard constructed and installed to conform to USAS B56.1-1969 "Safety Code for Powered Industrial Trucks." This guard may be removed only when it cannot be used due to the nature of the work being performed in which case loads shall be maintained so as not to create a hazard to the operator.
- (28) Protection from exhaust system. Any exhaust system which would be exposed to contact shall be properly insulated or isolated to prevent personnel from being burned. Exhaust systems on lift trucks and jitneys shall be constructed to discharge either within 20" from the floor or 84" or more above the floor. The exhausted gases shall be directed away from the operator and the equipment shall be designed in such a manner that the operator will not be exposed to the fumes.
- (29) Emergency exit from mobile equipment. Mobile equipment with an enclosed cab shall be provided with an escape hatch or other method of exit in case the regular exit cannot be used.
- (30) Vehicle wheels chocked. When driving mobile equipment onto the bed of a vehicle, the wheels of the vehicle shall be chocked.
- (31) Prevent trailer from tipping. Suitable methods shall be used or devices installed which will prevent the trailer from tipping while being loaded or unloaded.
- (32) Refueling. Gasoline or LPG engines shall be shut off during refueling.
- (33) Close valve on LPG container. Whenever vehicles using LP gas as a fuel are parked overnight or stored for extended periods of time indoors, with the fuel container in place, the service valve of the fuel container shall be closed.
- (34) LP tanks. LP vehicle fuel tanks shall be installed and protected in a manner which will minimize the possibility of damage to the tank.

(35) Inspecting and testing of LPG containers. LPG containers shall be inspected and tested periodically.

(36) Spinners on steering wheels. The use of spinners on steering wheels shall be prohibited unless an anti-kick device is installed or the equipment has a hydraulic steering system.

[Order 74-24, § 296-79-150, filed 5/6/74; Order 70-6, § 296-79-150, filed 7/10/70, effective 8/10/70.]

**WAC 296-79-160 Requirements for cranes and hoists—General safety and health standards to prevail.** All applicable rules for design, construction, maintenance, operation and testing of cranes and hoists contained in the general safety and health standards shall be complied with.

[Order 74-24, § 296-79-160, filed 5/6/74; Order 70-6, § 296-79-160, filed 7/10/70, effective 8/10/70.]

**WAC 296-79-170 Requirements for crawler and truck cranes.** (1) Rated capacity chart. A chart indicating the manufacturer's rated capacity at all operating radii for all permissible boom lengths and jib lengths with alternate ratings for optional equipment affecting such ratings shall be posted in all mobile type cranes and shall be readily visible to the operator in his normal operating position.

(2) Boom length indicated. The length shall be plainly marked on each boom section of a mobile crane having a sectioned boom.

(3) Radius or boom angle indicator. A radius or boom angle indicator shall be installed where it is readily visible to the operator in his normal operating position on all cranes having a movable working boom.

(4) Safety device for light fixtures. Any light fixtures attached to crane boom or machinery house shall have a safety strap or other device attached which will prevent the fixture from falling.

(5) Boom stops. Boom stops shall be installed to govern the upward travel of the boom to a safe limit. Boom stops shall be of adequate strength to prevent the boom from traveling past the vertical position.

(6) Controls marked. Crane operating controls shall be marked or an explanation of the controls' functions shall be posted in full view of the operator.

(7) Locking hydraulic outriggers. Hydraulic outriggers shall be equipped with a pilot operated check valve or a mechanical lock shall be installed which will prevent outriggers from retracting in case of failure of the hydraulic system.

(8) Top of boom painted. The top six feet of the boom or jib shall be painted bright yellow or other bright contrasting color if the boom is yellow.

(Several makes of cranes are already "all yellow." Users say they want to retain the contrasting color theme to call attention to the boomtop.)

(9) Warning devices. All cranes shall be equipped with a suitable warning device such as a horn or whistle.

(10) Hook safety device. All hooks shall be equipped with a safety device or other effective means shall be used to prevent accidental unhooking of the load.

(11) Counterweight limited. The amount of crane counterweight shall not exceed the maximum amount specified by the crane manufacturer.

(12) Use proper size wire rope for sheaves. The size and diameter of sheaves and wire rope shall be compatible and follow the recommendations published by the Wire Rope Institute or other acceptable engineering practices.

(13) Loading or unloading gear. Unloading gear such as grapples, tongs, and buckets, shall not be left suspended when not in use.

(a) Where grapples, trip tongs or similar device is used for loading, the log holding device shall be lowered to the ground whenever the machine is unattended.

(14) No one under load. Personnel shall not position themselves under crane loads and such loads shall not be carried over workers.

(15) Operating clearance from stationary objects. A distance of 30" shall be maintained between the outermost part of a revolving crane and any stationary object within the swing radius of the crane where the area is accessible to workers or the hazardous area must be temporarily guarded or barricaded.

(16) Clearance requirements from unprotected electrical transmission and distribution lines.

(a) Except as provided in subdivision (b), all parts of cranes and loads being handled shall maintain the following specified clearances:

(i) For lines rated 50 kv or below, minimum clearance between the lines and any part of the crane or load shall be ten feet;

(ii) For lines rated over 50 kv minimum, clearance between the lines and any part of the crane or load shall be 10 feet plus 0.4 inch for each 1 kv over 50 kv, or twice the length of the line insulator but never less than 10 feet;

(iii) In transit with no load and boom lowered the equipment clearance shall be a minimum of 4 feet for voltages less than 50 kv, and 10 feet for voltages over 50 kv up to and including 345 kv, and 16 feet for voltages up to and including 750 kv;

(iv) A person shall be designated to observe clearance of the equipment and give timely warning for all operations where it is difficult for the operator to maintain the desired clearance by visual means;

(v) Any overhead wire shall be considered to be an energized line unless and until the person owning such line or the electrical utility authorities indicate that it is not an energized line and it has been visibly grounded.

(b) Cranes may be operated within the clearances specified in subdivision (a) only when the following precautions are taken:

(i) Lines may be deenergized and visibly grounded at the point of work; or

(ii) Lines owned or under the control of the employer may be deenergized, grounded and locked out on the employer's premises; or

(iii) On N.E.C. approved installation of insulated aerial cable, insulating barriers, not a part of or an attachment to the equipment or machinery, may be erected to prevent physical contact with the line.

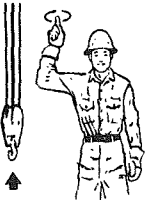
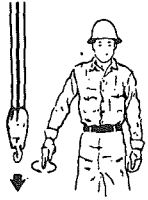
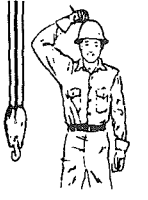

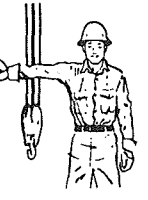
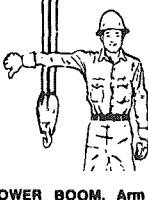
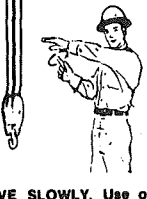
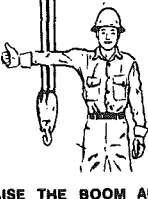
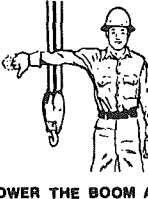
(17) Operators shall avoid contacting overhead obstructions which may damage the boom or adversely affect stability. In instances where the operator may have difficulty in observing clearances, a signal person shall be stationed where they can observe clearances and signal the operator.

(18) Safe travel across thoroughfares or railroad tracks. When moving across thoroughfares or railroad tracks with cranes, shovels or similar types of equipment, which by its design does not allow the operator clear vision of approaching traffic, a flagperson shall be stationed where he/she can control other traffic and signal the equipment operator.

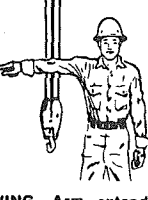
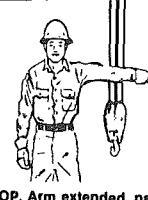
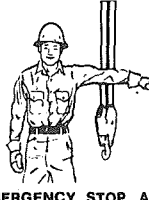
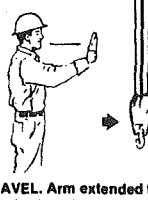
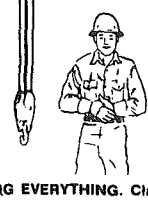
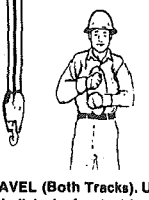

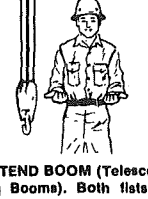
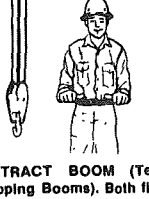


(19) One crew member to give signals. Only a designated member of the crew shall give signals to the crane operator except that anyone may give an emergency stop signal.

(20) Standard hand signals. When visual signals are used standard hand signals, as illustrated in the general safety and health standards, shall be used for directing crane operators.

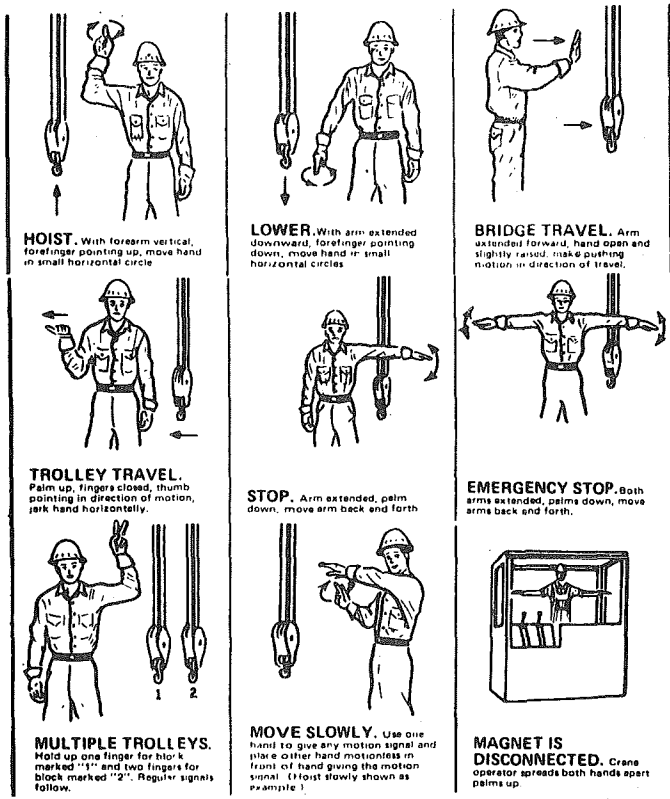
CRAWLER, LOCOMOTIVE, AND TRUCK CRANES  
STANDARD HAND SIGNALS

 <p><b>HOIST.</b> With forearm vertical, forefinger pointing up, move hand in small horizontal circle.</p>	 <p><b>LOWER.</b> With arm extended downward, forefinger pointing down, move hand in small horizontal circles.</p>	 <p><b>USE MAIN HOIST.</b> Tap flat on head; then use regular signals.</p>
 <p><b>USE WHIPLINE (Auxiliary Hoist).</b> Tap elbow with one hand; then use regular signals.</p>	 <p><b>RAISE BOOM.</b> Arm extended, fingers closed, thumb pointing upward.</p>	 <p><b>LOWER BOOM.</b> Arm extended, fingers closed, thumb pointing downward.</p>
 <p><b>MOVE SLOWLY.</b> Use one hand to give any motion signal and place other hand motionless in front of hand giving the motion signal. (Hoist slowly shown as example.)</p>	 <p><b>RAISE THE BOOM AND LOWER THE LOAD.</b> With arm extended, thumb pointing up, flex fingers in and out as long as load movement is desired.</p>	 <p><b>LOWER THE BOOM AND RAISE THE LOAD.</b> With arm extended, thumb pointing down, flex fingers in and out as long as load movement is desired.</p>

CRAWLER, LOCOMOTIVE, AND TRUCK CRANES (CONTINUED)

 <p><b>SWING.</b> Arm extended, point with finger in direction of swing of boom.</p>	 <p><b>STOP.</b> Arm extended, palm down, hold position rigidly.</p>	 <p><b>EMERGENCY STOP.</b> Arm extended, palm down, move hand rapidly right and left.</p>
 <p><b>TRAVEL.</b> Arm extended forward, hand open and slightly raised, make pushing motion in direction of travel.</p>	 <p><b>DQG EVERYTHING.</b> Clasp hands in front of body.</p>	 <p><b>TRAVEL (Both Tracks).</b> Use both flats in front of body, making a circular motion about each other, indicating direction of travel; forward or backward. (For crawler cranes only.)</p>
 <p><b>TRAVEL (One Track).</b> Lock the track on side indicated by raised flat. Travel opposite track in direction indicated by circular motion of other flat, rotated vertically in front of body. (For crawler cranes only.)</p>	 <p><b>EXTEND BOOM (Telescoping Booms).</b> Both flats in front of body with thumbs pointing outward.</p>	 <p><b>RETRACT BOOM (Telescoping Booms).</b> Both flats in front of body with thumbs pointing toward each other.</p>
 <p><b>RETRACT BOOM (Telescoping Boom).</b> One Hand Signal. One flat in front of chest, thumb pointing outward and heel of flat tapping chest.</p>	 <p><b>EXTEND BOOM (Telescoping Boom).</b> One Hand Signal. One flat in front of chest with thumb tapping chest.</p>	

OVERHEAD AND GANTRY CRANES  
STANDARD HAND SIGNALS



(21) Signals by use of radio frequencies. Class "D" citizen's band radio frequencies shall not be used for signaling crane operators.

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240, 81-13-053 (Order 81-9), § 296-79-170, filed 6/17/81. Statutory Authority: RCW 49.17.040, 49.17.240, and chapters 43.22 and 42.30 RCW, 81-03-007 (Order 80-31), § 296-79-170, filed 1/8/81; Order 74-24, § 296-79-170, filed 5/6/74; Order 70-6, § 296-79-170, filed 7/10/70, effective 8/10/70.]

**WAC 296-79-180 Privately owned standard gauge railroad operations.** (1) Blue flag or light. A blue signal (blue flag or blue light for nonilluminated areas) shall be displayed at one or both ends of an engine, car(s), or train, to indicate that workers are under or about the railway equipment. When such warning devices are displayed, the equipment shall not be coupled to or moved. On a dead end spur, a blue signal may be displayed adjacent to the switch opening while cars are being loaded or unloaded.

(2) Work being carried on which subjects employees to the hazard of moving railroad equipment shall be protected by blue signals and derails set a minimum of 50 feet from one or both ends of the worksite. Where the spur track switch is less than 50 feet from the work location, the switch padlocked in the open position will take the place of the derail and the blue signal shall be placed at that point.

(3) Signals unobscured. Equipment which would obscure the blue signal shall not be placed on the track.

[Title 296 WAC—p 1718]

(4) Signals displayed by each maintenance crew. Each maintenance crew shall display and remove its own set of blue signals.

(5) Warning device. A flashing warning light or other device shall be installed near any opening which leads to a passageway crossing railroad tracks adjacent to the building. Such light or device shall be activated prior to any switching or movement of railroad equipment to warn workers of the dangerous condition in the area.

(6) Cars to be immobilized. Spotted cars shall either have brakes set, wheels blocked, or shall be coupled to other immobilized cars to prevent each car from rolling.

(7) Crawling under or between coupled cars prohibited. Workers shall not crawl under or pass between coupled railroad cars to cross tracks.

(8) Warning at road crossing. An audible whistle, horn or bell shall be sounded by the locomotive engineer to give adequate warning prior to switching across any road crossing.

(9) Flying switches. When switching railroad equipment in congested areas or across roadways or walkways "flying switches" shall be prohibited.

(10) Car opening devices. All box car doors and associated mechanisms shall be carefully inspected before workers attempt to open or close them. If the door is not free and cannot be opened safely by hand, equipment shall be provided, where necessary, and a safe method shall be used to open or close the door.

(11) Clearance from railroad tracks. Materials shall not be stacked or piled closer than 8 1/2' from the center line of a standard gauge railroad track.

(12) Operating under limited visibility conditions.

(a) Unless trains are operated in a manner to allow the operator to see a safe stopping distance in the direction of travel, a flagperson(s) shall be positioned in such a manner to safely direct movement of the train.

(b) Flagperson shall remain within sight of the operator or shall be equipped to maintain visual or voice communication with the operator as conditions dictate.

(13) A flagperson shall direct the movement of trains being moved across main roads or thoroughfares which do not have adequate traffic warning lights, bells or barricades.

[Statutory Authority: RCW 49.17.040, 49.17.240, and chapters 43.22 and 42.30 RCW, 81-03-007 (Order 80-31), § 296-79-180, filed 1/8/81; Order 74-24, § 296-79-180, filed 5/6/74; Order 70-6, § 296-79-180, filed 7/10/70, effective 8/10/70.]

**WAC 296-79-190 Loading and unloading materials from railway cars or trucks.** (1) Safe access to top of railroad cars or trucks. Platforms with ladders or stairways shall be installed or made available when needed so that workers may safely gain access to and perform work on the top of railroad cars or trucks when ladders are not installed on such equipment.

(2) Nets not to cover ladders. Rolled chip nets shall not be positioned where they cover the ladders on railroad cars or trucks.

(3) Tipple type unloading device. When a tipple type unloading device is used for removing chips from cars,

(1989 Ed.)



the cars shall be properly secured in place and all employees shall be in the clear before dumping operation is started.

(4) Handling pulp chips and hog fuel from trucks and trailers.

(a) Elevating platform-type or cable-lift type unloading devices shall have adequate back bumper stops.

(b) Side rails or other positive means to prevent the trailer from falling shall be used while unloading single trailer units.

(c) The truck or tractor shall be secured when elevating platform lifts are used to elevate both the tractor and trailer or single unit trucks.

(d) All personnel shall be clear of all hoisting or elevating mechanisms before dumping commences.

(e) No person shall remain in any truck while the truck is being elevated.

(5) Taking chip samples. A safe area and suitable device shall be provided for the chip tester to use while taking chip samples.

(6) Derail required while unloading hazardous materials. To protect tank cars from being moved while loading or unloading hazardous materials by use of pipes or hoses, a derail and blue flag shall be set between the spotted tank cars and any moving railroad equipment.

(7) Moving cars by tugger or powered drums. When rail cars are moved by a tugger or powered drums with cables, a means should be provided or the area barricaded in such a manner that the moving cables do not endanger the workers.

(8) Handling pulpwood from flatcars and all other railway cars.

(a) Railroad flatcars for the conveyance of pulpwood loaded parallel to the length of the car shall be equipped with safety-stake pockets.

(b) Where pulpwood is loaded crosswise on a flatcar sufficient stakes of sizes not smaller than 4 by 4 inches shall be used to prevent the load from shifting.

(c) When it is necessary to cut stakes, those on the unloading side should be partially cut through first, and then the binder wires cut on the opposite side. Wire cutters equipped with long extension handles shall be used. No person shall be permitted along the dumping side of the car after the stakes have been cut.

(d) Cutting bands on log bundles. When cutting bands on bundled logs, workers shall position themselves in a safe location. Double bitted axes shall not be used for cutting bands. Caution shall be used to prevent being struck by ends of bands being cut and, if needed, personal protective equipment shall be worn.

(e) Flatcars and all other cars shall be chocked during unloading. Where equipment is not provided with hand brakes, rail clamping chocks shall be used.

(9) Handling pulpwood from trucks.

(a) Cutting of stakes and binder wires shall be done in accordance with (8)(c) of this section.

(b) Binders or stakes shall not be loosened or removed until the logs are secured and held by equipment which will prevent them from rolling off the truck, or barricades shall be provided which will prevent logs from striking the person removing the binders or stakes.

(c) Where binder chains and crane slings are used, the crane slings shall be attached and taut before the binder chains are released. The hooker shall see that the helper is clear before signaling for the movement of the load.

(d) Driver to leave truck cab while unloading. The truck driver shall leave the truck cab and be in the clear, preferably in a designated area, and shall be in clear view of the unloading equipment operator while the unloader is approaching the loaded truck.

(e) Driver to remain outside cab during unloading. The truck driver shall remain outside the cab and clear of the load while logs are being unloaded except that after a complete load is lifted as a unit and held stationary he may enter the cab and drive forward from under the suspended load.

[Order 74-24, § 296-79-190, filed 5/6/74; Order 70-6, § 296-79-190, filed 7/10/70, effective 8/10/70.]

**WAC 296-79-200 Bridge and dock plates.** Properly constructed bridge or dock plates shall be furnished and used to bridge the area between a dock and truck or railroad car. The following requirements shall be complied with for construction and use of such bridge or dock plates:

(1) Strength. The plate shall be capable of supporting three times the maximum load to which it will be subjected.

(2) Stops required. The plates shall be provided with positive stops to prevent the plates from shifting or moving.

(3) Plates to bear solidly. The plates shall bear solidly on the dock and on the floor of the car or truck. Plates with excessive teeter or rock shall be repaired or replaced.

(4) Upturn or lip on plates. The sides of bridge or dock plates shall have an upturn or lip of at least 4" covering the area between the edge of the loading dock and edge of car or truck floor whenever this distance exceeds 18" to prevent wheeled equipment from running off the sides.

(5) Bearing surface. Bridge or dock plates shall have at least 6" bearing surface on the loading dock.

(6) Suitable fittings to be used. Bridge or dock plates intended to be moved by mechanized equipment shall be designed for this purpose or appropriate fittings or attachments shall be used.

[Order 74-24, § 296-79-200, filed 5/6/74; Order 70-6, § 296-79-200, filed 7/10/70, effective 8/10/70.]

**WAC 296-79-210 Belt, chain and roller type conveyors, maintenance and inspection.** (1) Protection from falling material. Whenever conveyors pass adjacent to or over working areas or passageways used by personnel, protective guards shall be installed. These guards shall be designed to catch and hold any load or materials which may fall off or become dislodged and injure a worker.

(2) Walking on rolls prohibited. Employees shall not be allowed to walk on the rolls of roller type conveyors except for emergency.



(3) Guarding shaftway and material entrances of elevator type conveyors. Guards, screens or barricades of sufficient strength and size to prevent material from falling shall be installed on all sides of the shaftway of elevator type conveyors except at openings where material is loaded or unloaded. Automatic shaftway gates or suitable barriers shall be installed at each floor level where material is loaded or unloaded from the platform.

(4) Emergency conveyor stops. Conveyors shall be provided with an emergency stopping device which can be reached from the conveyor. Such device shall be located near the material entrance to each barker, chipper, saw, or similar type of equipment except where the conveyor leading into such equipment is under constant control of an operator who has full view of the material entrance and is located where he cannot possibly fall onto the conveyor.

(5) Safe access to conveyors. Where conveyors are in excess of 7' in height, means shall be provided to safely permit essential inspection and maintenance operations.

(6) Adjustment. All take-up devices provided for the purpose of adjusting for stretch in the belt, chain or cable should be checked at intervals for proper functioning and adjustment.

(7) Worn parts. Any part showing signs of significant wear shall be inspected carefully and replaced prior to reaching a condition where it may create a hazard.

(8) Replacement of parts. Replacement parts shall be equal to or exceed the manufacturer's specifications.

[Order 74-24, § 296-79-210, filed 5/6/74; Order 70-6, § 296-79-210, filed 7/10/70, effective 8/10/70.]

**WAC 296-79-220 Deactivating and lockout requirements.** (1) Tagout or other alternative security procedures shall be phased out by (one after effective date). In the one year interim, all requirements and procedures of this section shall apply except:

(a) Physical restraint devices other than padlocks may be used.

(b) Whenever devices other than identified padlocks are used, a warning information tag shall be required.

(c) Whenever the operating control cannot be physically blocked by the restraining device, a warning information tag shall be required.

(2) Control requirement. Whenever the unexpected startup of machinery, the energizing of electrical circuits, the flow of material in piping systems or the removal of guards would endanger workers, such exposure shall be prevented by deactivating and locking out the controls as required by this section.

**EXCEPTION:** In instances where any machine must be in motion for proper adjustment, for removal or replacement of materials from the machine, for machine clothing changes or for roping up, the following precautions shall be observed:

(a) The machine shall be operated at slow or jog speed;

(b) Extension tools which minimize personnel exposure shall be used where possible;

(c) The operating controls shall at all times be under the control of a qualified operator or craftsman;

(d) All personnel shall remain in view of the operator or other means of communication shall be established whenever possible;

(e) All personnel must be beyond the reach of other machine section(s) or element(s) which offer potential exposure. In any instance where such potential exposure exists, such other section(s) or element(s) shall be separately locked out.

(3) Equipment requirements.

(a) The employer shall provide and each employee shall use as many padlocks, tags, chains, or devices as required to implement these requirements.

(b) Provisions shall be made whereby the source of power or exposure can be locked out in accordance with the requirements of this section.

(c) On electrically powered equipment, "stop/start" control switches shall not be used as lockout switches. Lockout switches must be circuit disconnects and must adequately separate the power source from the prime mover so that accidental startup of the equipment being locked out is precluded.

(4) Training requirements.

(a) Each person who will be given authority to implement these requirements shall first be thoroughly trained in the requirements and procedures.

(b) Before being given authority to deactivate and lockout a particular system or piece of equipment, authorized personnel shall be made fully aware of all power sources and/or material entry sources which may offer exposure.

(c) On complex systems or equipment which contain multiple lockout points not at the immediate work location, a complete checklist of all lockout points necessary for isolation is recommended to help eliminate the chance of human error.

(5) Control procedure.

(a) Each person who would be exposed to the hazard shall apply a personal padlock on the control mechanism. Padlocks shall be applied in such a manner as to physically block the control from being moved into the operating position. Each lock shall be personally identified or an information tag identifying the owner shall be attached to the lock.

(b) Padlocks used in lockout procedures may only be removed by the person identified on the lock, except, when it is positively determined that the owner/user of the lock has left the premises without removing a lock, the job supervisor may remove the lock in accordance with a specific procedure formulated by the local plant labor/management safety committee or approved by the department.

(6) Testing after lockout or tagout. After tagging or locking out equipment, a test shall be conducted to ascertain that the equipment has been made inoperative or the flow of material has been positively stopped. Precautions shall be taken to ascertain that persons will not be subjected to hazard while conducting test if power source or flow of material is not shut off.

(7) Alternate lockout procedure. Before an alternate procedure can be utilized, a specific written procedure shall be reviewed by the local plant labor/management safety committee and approved by the department of labor and industries.

(8) Temporary or alternate power to be avoided. Whenever possible, temporary or alternate sources of power to the equipment being worked on shall be avoided. If the use of such power is necessary, all affected employees shall be informed and the source of temporary or alternate power shall be identified.

(9) Where tags are required to implement these lockout and control procedures, the tag and attachment device shall be constructed of such material that it will not be likely to deteriorate in the environment that it will be subjected to.

(10) Provisional exception. Electrical lighting and instrument circuits of 240 volts or less on single phase systems or 277 volts on three-phase systems may be exempted from the lockout requirements of (5)(a) of this section provided that:

(a) An information tag meeting the requirements of subsection (9) of this section is used in lieu of a padlock;

(b) The information tag shall be placed on the switch or switch cover handle in such a manner as to easily identify the deactivated switchgear.

(11) Deactivating piping systems.

(a) Hazardous material systems are defined as: Gasous systems that are operated at more than 200 psig; systems containing any liquid at more than 500 psig; systems containing any material at more than 130°F; systems containing material which is chemically hazardous as defined by NFPA 704 M Class 3 and 4; systems containing material classified as flammable or explosive as defined in NFPA Class I.

(b) Lockout of piping systems shall provide isolation to the worksite, including backflow where such potential exists and the system is classified as a hazardous material system. The required method shall be applied based on the content of the system as specified below:

(i) Nonhazardous systems shall be deactivated by locking out either the pump or a single valve.

(ii) Hazardous material systems shall be deactivated by one of the following methods:

(A) Locking out both the pump and one valve between the pump and the worksite;

(B) Locking out two valves between the hazard source and the worksite;

(C) Installing and locking out a blank flange between the hazard source and worksite;

(D) On hazardous chemical systems where methods (A), (B) or (C) are not available, or where methods (A), (B) or (C) by themselves create a hazard, single valve closure isolation may be used provided that potentially exposed employees are adequately protected by other means such as personal protective equipment.

(E) On all steam systems where methods (A), (B) or (C) are not available, single valve closure isolation may be used provided that the system is equipped with valves meeting all requirements of ANSI B16.5 and ANSI B16.34. Where single valve isolation is used, the

steamline must also be equipped with a bleed valve downstream from the valve closure to prove isolation of the worksite.

(12) Reactivating separated hazardous material systems. When a blank flange (blind) is used to separate off portions of hazardous material systems from a portion which is in operation, removal of the blind offers potential exposure to employees. The removal procedure shall be protected by:

(a) Two separate valve closures between the blank flange and the potential exposure; or

(b) A single valve closure with a bleeder valve or weep drain between the blank flange and the valve closure. Employees shall closely check for evidence of escape-ment from the bleeder valve or weep plug before starting to remove the blank flange.

(c) Where subdivisions (a) or (b) are not possible or, in themselves create a hazard, potentially exposed employees must be adequately protected by personal protective equipment before removing the blank flange.

(d) Bleeder valves are recommended behind all primary valve closures on hazardous material systems. Consideration should be given to the nature of the material in the system when installing bleeder valves. To assist in preventing plugging, bleeder valves should generally be installed in the top one-third of the pipe. Short exhaust pipes should be installed on bleeder valves to direct the flow of possible escapement away from the position where an employee would normally be when using the bleeder valve.

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-13-053 (Order 81-9), § 296-79-220, filed 6/17/81. Statutory Authority: RCW 49.17.040, 49.17.240, and chapters 43.22 and 42.30 RCW. 81-03-007 (Order 80-31), § 296-79-220, filed 1/8/81; Order 76-7, § 296-79-220, filed 3/1/76; Order 74-24, § 296-79-220, filed 5/6/74; Order 70-6, § 296-79-220, filed 7/10/70, effective 8/10/70.]

**WAC 296-79-230 Vessel or confined area requirements.** (1) Management's responsibility for planning. Management shall be responsible for developing a written procedure to be followed for safe entry of employees into confined areas, tanks, vessels, or sewers and for maintaining a safe condition while work is being performed therein. Such procedure shall include the following minimum requirements:

(a) All vessels, sewers or confined areas must be properly ventilated at all times. Such areas shall be tested and/or evaluated by a person thoroughly trained and instructed in the use of instruments required, or qualified to make evaluations of conditions which may be encountered, before employees enter and at reasonable intervals as work progresses. Special consideration shall be given to the possibility that the area may be deficient of oxygen or may contain dangerous concentrations of gases or toxic substances.

(b) Each vessel, tank or confined area shall be cleaned and/or purged as thoroughly as practical prior to entry.

(c) All equipment necessary to perform the work, including safety equipment, must be at the job site and shall be inspected or tested to assure that it functions properly.

(d) All electrical circuits, valves, ducts, pipes, and other equipment shall be locked out, tagged out, or blanked as required in accordance with the applicable rules contained in WAC 296-79-220 of this chapter.

(e) Prior to and while welding or burning is being done in areas where a fire or explosion hazard may exist, the applicable rules contained in WAC 296-79-040 of this chapter, shall be complied with.

(f) For evaluating conditions concerning health, fire or explosion hazards, requirements outlined in the general occupational health standards, chapter 296-62 WAC, shall be followed.

(2) Designated person in charge. Management shall designate an individual who shall be responsible for the safety of the employees and institute such means, methods, and practices as to render the work and place of work safe. The designated person shall ascertain that the required written procedures are followed.

(3) Employees to be thoroughly instructed in procedure. All employees involved in the entry of vessels or confined areas shall be thoroughly instructed in safe procedures to be followed.

(4) Protective equipment required. Any employee entering a vessel or enclosed area shall use any protective equipment or clothing needed to afford him proper protection. Each person shall wear equipment capable of providing safe respirable air if the area may be deficient of oxygen or shall wear proper respiratory protective equipment if the atmosphere may contain a hazardous concentration of contaminants. In addition, while entering or working in an atmosphere immediately hazardous to health, employees shall wear a safety harness with lifeline attached and continue to wear such equipment so long as the hazard exists.

(5) Attendant required. An attendant shall remain outside at the opening of the confined area to render assistance necessary to persons inside. The attendant shall be provided with life support equipment necessary for his protection if an emergency arises which would require him to enter the area.

(6) Life support equipment required. Life support equipment which will afford proper protection to the employee from any condition which may arise shall be available either within the vessel or confined area or at the entrance thereto.

(7) Mechanical device required when entry from the top. Where employees must enter a vessel or confined area from the top, and where it would be impossible to manually rescue or remove overcome persons in the area, a mechanical device shall be provided with which the attendant can lift employees out.

(8) Electrical shock protection. Electrical circuits leading into vessels or confined areas where electrical conductive hazards exist shall be protected by a ground fault interrupter or the voltage shall not exceed 24 volts.

(9) Battery operated flashlights or lanterns. Battery operated flashlights or lantern shall be readily available for use by persons working in areas where escape would be difficult if normal lighting system should fail. Only explosion-proof type lights shall be taken into any atmosphere which may contain an explosive concentration.

(10) Use of materials which may create hazardous atmosphere. Tests shall be conducted at reasonable intervals when using materials for cleaning, coating or other purposes which may cause the atmosphere to become hazardous.

[Order 74-24, § 296-79-230, filed 5/6/74; Order 70-6, § 296-79-230, filed 7/10/70, effective 8/10/70.]

**WAC 296-79-240 Storage of fuel, oil, flammables and chemicals.** (1) Handling and labeling of flammable and hazardous materials. Containers of toxic, flammable or irritating substances shall be properly labeled and stored as specified in "precautionary labeling of hazardous substances used in places of employment," as adopted by the department of labor and industries.

(2) To be stored away from sources of ignition. Fuels, oils, flammable chemicals or other flammable materials shall be stored in a room or area away from sources of ignition.

(3) Provide for safe handling. Provisions shall be made for handling drums safely and means shall be afforded to position drums on their sides when material must be discharged from a valve or spigot placed in the top of the drum.

(4) Bonding (grounding) required. When dispensing material which may be ignited by static electricity, a method shall be provided to properly bond (ground) the drum and container into which material is being dispensed.

(5) Storage of drums. Drums shall be stored in a manner which will prevent them from falling or rolling.

(6) Bagged or drummed chemicals. Bagged or drummed chemicals shall be handled properly to prevent spillage or damage to the containers. Chemicals shall be stored in such a manner that they will not decompose, contaminate, or react with other chemicals which could present a hazard. The manufacturer's safe practices recommendations or those published by the Manufacturing Chemists Association should be followed.

(7) Storing liquid chlorine tanks. Sufficient and adequate ventilation shall be provided when liquid chlorine tanks are stored in a room. At least two exits, remote from each other, shall be provided for all rooms in which chlorine is stored.

(8) Hoops for acid storage tanks. Hoops of tanks shall be made of rods rather than flat strips and shall be safely maintained by scheduled inspections.

(9) Turpentine systems and storage tanks. Nonsparking tools and ground hose shall be used when pumping out the tank. The tank shall be surrounded by a berm or moat. Drainage or diking of tanks shall comply with the general safety and health standards, WAC 296-24-33005.

[Order 76-7, § 296-79-240, filed 3/1/76; Order 74-24, § 296-79-240, filed 5/6/74; Order 70-6, § 296-79-240, filed 7/10/70, effective 8/10/70.]

**WAC 296-79-250 Safety procedure for handling dry sulfur.** (1) Sulfur burners. Sulfur-burner houses shall be safely and adequately ventilated, and every precaution shall be taken to guard against dust, explosion

hazards and fires, in accordance with American National Standards Z9.2-1960 and Z12.12-1968.

(a) Nonsparking tools and equipment shall be used in handling dry sulfur.

(b) Sulfur storage bins shall be kept free of sulfur dust accumulation, and buildings should be designed with explosion relief, in accordance with American National Standard Z9.2-1960.

(c) Electrical equipment shall be of the explosion-proof type, in accordance with the safety standard for installing electric wires and equipment, chapter 296-46 WAC, and WAC 296-24-950 and 296-24-955, general safety and health standards.

(d) Sulfur-melting equipment shall not be located in the burner room.

[Order 76-7, § 296-79-250, filed 3/1/76; Order 74-24, § 296-79-250, filed 5/6/74; Order 70-6, § 296-79-250, filed 7/10/70, effective 8/10/70.]

**WAC 296-79-255 Safety procedure for handling liquid sulfur.** (1) Each facility utilizing liquid sulfur shall carefully examine its own handling system and formulate a written procedure for maintenance, receiving, storing and using this product. Minimum requirements for the procedure shall be as follows:

(a) Maintenance personnel and all personnel who work at unloading or usage points shall be adequately trained to recognize the dangers of escapement from the system and first aid practices to be followed in the event of exposure.

(b) Adequate protective equipment (gloves, goggles, etc.) and respiratory protective equipment shall be provided at appropriate locations and personnel who reasonably could be exposed shall be trained in the proper use of these items.

(c) A minimum of two trained employees shall be assigned when a tank car is first opened in preparation for venting and unloading. Approved respiratory protective equipment for H<sub>2</sub>S exposure, chemical splash goggles and gloves shall be worn when performing this work. Spark producing or electric operated tools shall not be used to unplug railroad car vents.

(d) Where venting can cause harmful exposure to other unprotected workers in the area, a venting system shall be installed which adequately contains any gas escapement from a tank car while venting. The vented gas shall be carried to a safe location for discharge or circulated through a scrubbing system. The venting system shall be connected before valves which would allow escapement are opened.

(e) No smoking, open burning or welding shall be permitted while unloading is in process or danger of gas escapement exists.

**(2) Maintenance.**

(a) Any maintenance which involves opening a part of the handling system shall be attempted only after purging that portion of the system as completely as is practical.

(b) All sources of possible contamination into the purged section shall be isolated by valving off or blank

flanging. The lockout-tagout procedures contained in WAC 296-79-220 of this chapter, shall be followed.

(c) When opening the system, protective equipment shall be worn by the person or persons involved until such time as the equipment is proven to be free of contamination in harmful quantity.

(d) The danger of heating any portion of the system shall be carefully explained to maintenance crews. Adequate safety procedures shall be followed if heating, welding or cutting are to be attempted.

(e) Any maintenance requiring entry into a portion of the system shall be done in compliance with WAC 296-79-230 of this chapter.

[Order 74-24, § 296-79-255, filed 5/6/74.]

**WAC 296-79-260 Pulpwood storage and handling.**

(1) Proper piling of logs. Logs shall be piled or removed in an orderly manner. The piles shall be stable and individual logs properly placed to prevent them from rolling or falling. The ends shall not project into walkways, roadways or areas reserved for other purposes and sufficient clearance shall be maintained for safe travel of all vehicles and loads.

(2) Prohibited use of wire rope doglines. Wire rope doglines used for towing or rafting shall not be used when:

(a) They acquire jiggers to the extent that they present a hazard to the employees handling them; or

(b) When they are weakened to the extent that they are hazardous.

(3) Boom stick to support weight. Boom sticks shall be capable of safely supporting the weight imposed upon them.

(4) Stiff boom construction. Stiff booms shall be made by fastening not less than two boom sticks together. The width of the stiff boom shall be not less than 36" measured from outside to outside of the outer logs. The boom sticks shall be fastened together with not less than 4" by 6" cross ties or cable lashing properly recessed into notches in the boom sticks and secured.

(5) Pike poles. Pike poles shall be kept in good repair. Conductive pike poles shall not be used when it is possible that they may come in contact with electrical conductors.

(6) Logs not to be lifted over employees. Logs shall not be lifted over employees and employees shall stay clear of the hazardous area near where logs are being lifted or swung.

(7) Log storing or sorting in water. Storing or sorting on water or any boom work other than boom boat operations, shall require a minimum of two persons.

(8) Overhead protection on mobile equipment. All mobile equipment used to handle logs, blocks or cants shall be provided with adequate overhead protection.

(9) Arrangement of unloading lines. Unloading lines shall be so arranged that it is not necessary for the worker to attach them on the pond or dump side of the load.

(10) Unauthorized traffic prohibited. Unauthorized vehicles and unauthorized foot traffic shall not be allowed in any active sorting, storing, loading, or unloading areas.

(11) Safe movement of equipment. Log unloaders shall not be moved about the premises with loads raised higher than absolutely necessary.

(12) High visibility jackets or vests required. Jackets or vests of fluorescent or other high visibility material shall be worn by persons working on dry land log storage.

(13) Dumps to be cleaned. All log dumps shall be periodically cleared of bark and other debris.

(14) Hand tools. Handles of wood hooks shall be locked to the shank to prevent them from rotating.

[Order 74-24, § 296-79-260, filed 5/6/74; Order 70-6, § 296-79-260, filed 7/10/70, effective 8/10/70.]

**WAC 296-79-270 Pulpwood preparation--Scope and application.** All sections of this chapter which include WAC 296-79-270 in the section number apply to pulpwood preparation.

[Order 74-24, § 296-79-270, filed 5/6/74; Order 70-6, § 296-79-270, filed 7/10/70, effective 8/10/70.]

**WAC 296-79-27001 Barkers, chippers, and hog feed devices.** (1) Barker feeding devices shall be designed in such a manner that the operator will not be required to hold or make any physical contact with any log or bolt during the barking operations.

(2) Walkways or floors alongside the drum of any barker shall be equipped with standard guardrails on each side exposed to the drum.

(3) Employees shall not enter any hazardous area in or around a barker until the main disconnect switch has been opened and locked or tagged out and the switch has been tried to assure that the equipment is de-energized.

(4) A dog or locking device in addition to the motor switch, clutch, belt shifter or other power disconnecting device shall be installed on all intermittent barking drums to prevent the drum from moving while it is being filled or emptied.

(5) Hydraulic barkers.

(a) The inlet and outlet areas of hydraulic barkers shall be equipped with baffles or devices which will reasonably prevent material from flying out while the machine is in operation.

(b) The operator shall be protected by at least five-ply laminated glass or material of equivalent strength.

(6) When changing knives in a barker, chipper or hog, the main disconnect switch shall be opened and locked or tagged out.

(7) The high pressure hoses of hydraulic barkers shall be secured in such a manner that the hose connection ends will be restrained if a hose connection fails.

(8) The feed operator's station shall not be in direct line with the chipper blades. Suitable safeguards shall be installed to prevent chips or chunks from being thrown out and striking the person feeding the machine.

(9) The feed entrance shall be barricaded by means of a standard height guardrail so as to prevent anyone from falling into the chipper.

(10) When the operator cannot readily observe the material being fed into the chipper, a mirror shall be installed in such a position that the ingoing material can be observed.

(11) Safety belts with lifelines attached and face protection shall be worn by employees who manually feed material or clear jams in machines unless other provisions are made which will protect the employees.

(12) Iron bars shall not be used to clear jams or plug-up at the feed entrance to a chipper or hog while the machine is running.

(13) Speed governor. Water wheels, when directly connected to marker disks or grinders, shall be provided with speed governors, if operated with gate wide open. Water wheels directly connected to pulp grinders shall be provided with speed governors limiting the peripheral speed of the grinder to that recommended by the manufacturer.

(14) Knot cleaners. The operators of knot cleaners of the woodpecker type shall wear eye protection equipment. Knot cleaners of the woodpecker type should be enclosed to protect passersby from flying chips.

[Order 74-24, § 296-79-27001, filed 5/6/74.]

**WAC 296-79-27003 Log hauls, slips, and carriages.**

(1) Controls shall be arranged to operate from a position where the operator will at all times be in the clear of logs, machinery, lines, and rigging. Controls shall be marked to indicate their function.

(2) A guard shall be provided to prevent logs from rolling off the log deck into the well.

(3) When needed for protection of personnel, an automatic stop or interlocking device shall be installed on log hauls or slips.

(4) A barricade or other positive stop of adequate strength shall be provided to protect the sawyer from rolling logs.

(5) Canting gear or other equipment shall not be allowed to hang over the log deck in such a manner as to endanger employees.

(6) Canting gear controls shall be marked to indicate their function.

(7) The sawyer shall be primarily responsible for the safety of the carriage crew and offbearers. He shall exercise due care in the operation of the carriage and log turning devices.

(8) Feed works and log turning control levers shall be so arranged that they may be secured when not in use and shall be adequately guarded against accidental activation.

(9) A control device shall be provided so that the sawyer may stop the head rig section of the mill without leaving his stand.

(10) An effective method of disengaging the head rig saws from the power unit shall be installed on all head rigs where the power unit is not directly controlled by the sawyer. The saws shall be disengaged from the

source of power and locked or tagged out before repairs or changes are made.

(11) The sawyer shall be safeguarded either by his location or by use of substantial screens or approved safety glass.

(12) Carriages upon which persons are required to work shall be solidly decked over and the employee properly protected.

(13) The feed control lever of friction or belt driven carriage feed works shall be designed to operate away from the saws or carriage track.

(14) A substantial stop or bumper shall be installed at each end of the carriage run.

(15) Substantial sweeps shall be installed in front of each carriage wheel. Such sweeps shall extend to within 1/4 inch of the rails.

(16) Where power operated log turners are used, carriage knees shall be provided with goosenecks or other substantial means of protecting the carriage crew.

[Order 74-24, § 296-79-27003, filed 5/6/74.]

**WAC 296-79-27005 Band saws.** (1) Band saws shall be given a thorough daily inspection and any deficiency reported and corrected.

(2) Any band saw found to have developed a crack greater than one-tenth the width of the saw shall be removed from service until the width of the saw is reduced to eliminate the crack, the cracked section is removed, or the development of the crack is arrested by welding.

(3) Band saws shall not be continued in use on the head rig for which they have been designed after they have been reduced 40% in width.

(4) Band saw guides shall be maintained in good condition and proper alignment at all times.

(5) All head band saw wheels shall have a minimum rim thickness of 5/8", except for a distance not to exceed one inch from the front edge of the wheel.

(6) Band saws shall not be run at a speed in excess of the manufacturer's recommendations.

(7) A band wheel that has developed a crack in the rim shall be immediately removed from service. If a crack has developed in a spoke, the wheel shall be removed from service until properly repaired.

(8) All band wheel guards shall be constructed of not lighter than ten U.S. Gauge metal, or not less than two-inch wood material or equivalent, attached to substantial frames. Necessary ventilating ports, not larger than two by four inches, and suitable doors or gates for the lubrication and repair of the saw will be permitted.

(9) Every band mill shall be equipped with a saw catcher, rest or guard of substantial construction.

(10) Each gang ripper of band or straight saw type shall have the cutting edges of the saw guarded by a hood or screen substantially secured to the framework of the machine.

[Order 74-24, § 296-79-27005, filed 5/6/74.]

**WAC 296-79-27007 Circular saws speeds and repairs.** (1) Circular saws shall not be operated at speeds in excess of those specified by the manufacturers.

(1989 Ed.)

(2) Circular saws shall be inspected for cracks each time the teeth are filed or set. They shall be discontinued from use until properly repaired when found to have developed a crack exceeding the safe limits specified by the manufacturer.

(3) Damaged saws shall be repaired only by persons experienced and knowledgeable in this type of work or by a manufacturer's representative.

[Order 74-24, § 296-79-27007, filed 5/6/74.]

**WAC 296-79-27009 Slasher saws--tables.** (1) Slasher saws shall be guarded in accordance with WAC 296-79-030(4) of this chapter.

(2) Saws shall be stopped and locked or tagged out whenever it is necessary for any person to be on the slasher table.

(3) Saws below table where not protected by the frame of the machine, the underside of the slasher saws shall be adequately guarded.

[Order 74-24, § 296-79-27009, filed 5/6/74.]

**WAC 296-79-27011 Circular swing saws.** (1) Each circular swing saw shall be provided with a hood guard that completely encloses the upper half of the saw.

(2) Each swing saw shall be equipped with a positive stop at the extent of the swing necessary to cut the material.

[Order 74-24, § 296-79-27011, filed 5/6/74.]

**WAC 296-79-27013 Drag saws--Fixed chain saws--Circular cut-off saws.** (1) Saws shall be so arranged that they will not project into any passageway when in an idle or working position. When existing conditions do not leave clear passage the saws shall be fenced off in order to make it impossible for anyone to walk into them.

(2) Log decks shall be equipped with a device to hold the material stable when being cut.

(3) Drag saws and fixed chain saws shall be equipped with a device that will safely lock them in an "up" position.

(4) All persons shall be in the clear before starting operations of a drag-chain or swing saw.

[Order 74-24, § 296-79-27013, filed 5/6/74.]

**WAC 296-79-27015 Construction and use of pulp-wood splitters.** (1) The activating control unit for a splitter shall be of the clutch or positive acting type and shall be so arranged and designed that it will not repeat without additional activation before starting a second cycle.

(2) The base or rest upon which the wood seats while being split shall have a corrugated surface or other means shall be provided which will prevent the wood block or log from shifting as the pressure is applied.

(3) The splitter base or rest and wood to be split shall be free of ice, snow, and chips.

(4) The splitter machine operator shall have a clear, unobstructed view of the work area adjacent to the

[Title 296 WAC--p 1725]



splitting operation when other workers must be in such area while blocks are being split.

[Order 74-24, § 296-79-27015, filed 5/6/74.]

**WAC 296-79-280 Chip and hog fuel storage.** (1) Entry into bins and silos.

(a) No worker shall be permitted to enter a bin unless provided with a safety belt, with line attached, and an attendant stationed at the bin to summon assistance.

(b) Before entry into chip bins and silos, all applicable rules under vessel entry, WAC 296-79-230, of this chapter, shall be complied with.

(c) Chip and sawdust bins. Steam or compressed air lances, or other facilities, shall be used for breaking down the arches caused by jamming in chip lofts.

(d) Employees shall be prohibited from working under overhangs or bridges. Extreme care shall be taken to prevent chips or hog fuel from creating an overhang or bridging.

(e) Hog fuel bins shall be provided with an approved railed platform or walkways near the top or other approved means shall be provided for use of employees engaged in dislodging hog fuel.

(2) Exterior chip and hog fuel storage. When mobile equipment is used on top of hog fuel or chip piles, a roll-over protection system shall be installed on the equipment. If the cab is of the enclosed type, windshield wipers shall be installed. If used during hours of darkness the area shall be adequately illuminated or the equipment shall have adequate lights to provide the operator sufficient illumination to safely perform the work.

[Order 74-24, § 296-79-280, filed 5/6/74; Order 70-6, § 296-79-280, filed 7/10/70, effective 8/10/70.]

**WAC 296-79-290 Stock preparation and reprocessing--Scope and application.** All sections of this chapter which include WAC 296-79-290 in the section number apply to stock preparation and reprocessing.

[Order 74-24, § 296-79-290, filed 5/6/74; Order 70-6, § 296-79-290, filed 7/10/70, effective 8/10/70.]

**WAC 296-79-29001 Digester valves and piping.** The blow valve of a digester shall be arranged so as to be operated from another room, remote from safety valves.

(1) Digester piping shall meet the criteria of the boiler and pressure vessel standards.

(2) Heavy duty pipe, valves, and fittings shall be used between the digester and blow pit. These valves, fittings, and pipes shall be inspected at least semiannually to determine the degree of deterioration and should be replaced when necessary.

(3) Digester blow valves or controls shall be pinned or locked in closed position throughout the entire cooking period.

[Order 74-24, § 296-79-29001, filed 5/6/74.]

**WAC 296-79-29003 Warning of digester being blown.** Audible warning signals and red warning lights shall be installed in areas which may be hazardous to personnel while digesters are being blown. Such devices

shall be activated prior to blowing a digester and the warning lights shall remain lighted as long as the hazard exists.

(1) Blowing digester. Blowoff valves shall be opened slowly.

(2) After the digester has started to be blown, the blow-off valve shall be left open, and the hand plate shall not be removed until the person responsible signals the blow-pit person that the blow is completed. Whenever it becomes necessary to remove the hand plate to clear stock, operators shall wear eye protection equipment and protective clothing to guard against burns from hot stock.

(3) In addition to the vessel entry procedure of WAC 296-79-230, of this chapter, the blow pit door or hatch shall be locked open whenever a person is in the blow pit.

(4) Blow pit hoops shall be maintained in a safe condition.

(5) Where the processes of the sulfate and soda operations are similar to those of the sulfite processes, the standard of WAC 296-79-29001 and 296-79-29003, of this chapter, shall apply to both processes.

(6) At least one unobstructed exit at each end of the room shall be provided on each floor of a digester building.

(7) Means shall be provided whereby the digester cook shall signal the man in the chip bin before starting to load the digester.

[Order 77-12, § 296-79-29003, filed 7/11/77; Order 76-7, § 296-79-29003, filed 3/1/76; Order 74-24, § 296-79-29003, filed 5/6/74.]

**WAC 296-79-29005 Unplugging quick lime stoppages.** Water shall not be used to unplug quick lime stops or plugs in pipes or confined spaces.

[Order 74-24, § 296-79-29005, filed 5/6/74.]

**WAC 296-79-29007 Bleach plant.** (1) Work areas used for preparation and processing of bleaching mixtures shall be equipped with properly designed exhaust ventilation systems capable of clearing the area of toxic gases.

(2) Bleaching containers, such as cells, towers, etc., except the Bellmer type, shall be completely covered on the top, with the exception of one small opening large enough to allow filling but too small to admit a person. This opening should be covered by a door and guarded with standard guardrail and toeboards. Platforms leading from one engine to another shall have standard guardrails in accordance with the general safety and health standards, WAC 296-24-75007.

[Order 74-24, § 296-79-29007, filed 5/6/74.]

**WAC 296-79-29009 Audible alarm in bleach plant.** An audible alarm system shall be installed and it shall be activated whenever a serious leak or break develops in the bleach plant area which creates a health or fire hazard.

[Order 74-24, § 296-79-29009, filed 5/6/74.]



**WAC 296-79-29011 Pocket grinder doors.** Doors of pocket grinders shall be so designed and arranged as to keep them from closing accidentally.

[Order 74-24, § 296-79-29011, filed 5/6/74.]

**WAC 296-79-29013 Pulping device procedures.** Each company shall develop a safe procedure which shall be followed for feeding, clearing jams, or removing foreign objects from any pulping device. These procedures shall comply with applicable provisions of this standard.

[Order 74-24, § 296-79-29013, filed 5/6/74.]

**WAC 296-79-29015 Off machine repulping devices.**

(1) When fed manually from the floor above, conveniently located emergency stop devices shall be provided at the top level.

(2) When fed from floor above, the chute opening, if less than standard guardrail height from the feed platform or floor, shall be provided with a complete guardrail or other enclosure to standard guardrail height. Openings for manual feeding shall be sufficient only for entry of stock and shall be provided with at least two permanently secured crossrails, in accordance with, the general safety and health standards, WAC 296-24-75003.

[Order 74-24, § 296-79-29015, filed 5/6/74.]

**WAC 296-79-29017 Pulping device cleaning, inspection and repairing.** When cleaning, inspecting or other work requires that persons enter pulping devices, all control devices shall be locked or tagged out in accordance with the requirements of this standard.

[Order 74-24, § 296-79-29017, filed 5/6/74.]

**WAC 296-79-29019 Guarding hand knives and sharpening steels.** Hand knives and sharpening steels used in rag and old paper preparation, shall be provided with guards at the junction of the handle and the blade. Stanley-type utility knives with blade exposure 2 1/2 inches or less are exempted from this requirement.

[Order 74-24, § 296-79-29019, filed 5/6/74.]

**WAC 296-79-29021 Shredders and blowers.** On manually fed broke shredders, the feed table shall be of such height and distance from the knives as to prevent the operator from reaching or falling into the knives or the operator shall be safeguarded by other acceptable means.

(1) A smooth-pivoted idler roll resting on the stock or feed table shall be provided in front of feed rolls except when arrangements prevent the operator from standing closer than 36 inches to any part of the feed rolls.

(2) Any manually fed cutter, shredder, or duster shall be provided with an idler roll as specified in (1) of this section or the operator shall use special hand-feeding tools.

(3) Hoods of cutters, shredders, and dusters shall have exhaust ventilation, in accordance with American National Standard Z9.2-1960 and chapter 296-62 WAC, general occupational health standards.

(4) Blowers used for transporting rags shall be provided with feed hoppers having outer edges located not less than 48 inches from the fan.

(5) The arrangement of the blower discharge outlets and work areas shall be such as to prevent material from falling on workers.

[Order 74-24, § 296-79-29021, filed 5/6/74.]

**WAC 296-79-29023 Clearing shredder jams.** To clear jams or blockage to the machine, the operator shall use objects which will not create a hazard. The use of metal bars for such purposes is prohibited.

[Order 74-24, § 296-79-29023, filed 5/6/74.]

**WAC 296-79-29025 Repairing shredders.** Repairs shall be done only when the shredder is shut down and the control devices are locked or tagged out in accordance with the requirements of this standard.

[Order 74-24, § 296-79-29025, filed 5/6/74.]

**WAC 296-79-29027 Guillotine type roll splitters.**

(1) The engaging control for activating the guillotine blade shall be a positive two-hand operating control or located far enough from the cutting location so that the operator cannot reach the blade during the cutting process. In either control method, "deadman type" switch gear which demands continuous operator activation shall be installed and used.

(2) Personnel shall not position any part of the body under the blade.

(3) Rolls shall be in the horizontal position while being split.

(4) Rolls shall be centered directly below the blade.

[Order 76-7, § 296-79-29027, filed 3/1/76; Order 74-24, § 296-79-29027, filed 5/6/74.]

**WAC 296-79-29029 Broke hole.** (1) An alarm bell or flashing light shall be actuated or other suitable warning shall be given before dropping material through a broke hole when persons working below may be endangered.

(2) Broke holes shall be guarded to the fullest extent possible consistent with operational necessities. The degree of guarding provided by standard height and strength guardrails will be considered as a minimum acceptable level of protection.

(3) When repulping devices or feed conveyor systems for repulping devices are located beneath broke holes, special precautions shall be used. The broke hole opening shall be reduced to the smallest practical dimension. If such broke hole opening must be large enough to permit a worker to fall through and the opening is not guarded at least to the equivalent degree of protection provided by standard guardrails, any employee pushing broke down the broke hole shall wear a safety belt attached to a safety belt line. The safety belt line shall be

fastened in such a manner that it is impossible for the person to fall into the repulping device.

(4) Guarding to the equivalent degree of protection provided by standard guardrails and meeting the requirements of subsections (2) and (3), may be achieved by the use of guard bars separated no more than 15-1/2 inches in a vertical plane and 12 inches in a horizontal plane, or any other location within that segment.

[Statutory Authority: RCW 49.17.040, 49.17.240, and chapters 43.22 and 42.30 RCW. 81-03-007 (Order 80-31), § 296-79-29029, filed 1/8/81; Order 74-24, § 296-79-29029, filed 5/6/74.]

**WAC 296-79-29031 Industrial kiln guns and ammunition.** Management shall develop written instructions, including safety procedures, for storing and operating industrial kiln guns and ammunition. All personnel working with this equipment shall be instructed in these procedures and shall follow them.

[Order 74-24, § 296-79-29031, filed 5/6/74.]

**WAC 296-79-29033 Chlorine dioxide system. (1) Sodium chlorate.**

(a) Personnel handling and working with sodium chlorate shall be thoroughly instructed in precautions to be used in handling and special work habits. Refer to Manufacturing Chemists Association Chemical Data Sheet No. SD-42 (Sodium Chlorate).

(b) Personnel exposed to direct contact with sodium chlorate shall wear neoprene or other special protective clothing and special footwear.

(c) Facilities for storage and handling of sodium chlorate shall be constructed so as to eliminate possible contact of dry or evaporated sodium chlorate with wood or other material which could cause a fire or explosion. Refer to Manufacturing Chemists Association Chemical Data Sheet No. SD-42 (Sodium Chlorate).

(d) Sodium chlorate facilities should be constructed with a minimum of packing glands, stuffing boxes, etc. Refer to Manufacturing Chemists Association Chemical Data Sheet No. SD-42 (Sodium Chlorate).

(2) Chlorine dioxide.

(a) Chlorine dioxide generating and storage facilities shall be placed in areas which are adequately ventilated and are easily kept clean of wood, paper, pulp, etc., to avoid contamination which might cause a reaction. This can be accomplished by placing these facilities in a separate room or in a designated outside space.

(b) Only authorized personnel shall be allowed in close proximity to the chlorine dioxide generating equipment. The generating area shall have signs warning of the hazard and restricting entrance to authorized personnel only.

(c) When reasonably possible, the sample station should be located on the outside of the generating room. Goggles must be worn when taking samples.

(d) Two alternate direction exits shall be provided from the generator working areas.

(3) General.

(a) Safety showers and/or jump tanks and eye wash facilities shall be provided for persons working around

sodium chlorate and the other hazardous chemicals involved in this process.

(b) Water hoses for flushing spills shall be adequate in size and located where needed.

(c) All equipment involved in this process where pressure may be generated shall be provided with adequate pressure relief.

(d) Welding or burning shall not be performed on the generator system while it is operating. Immediately before maintenance can be performed on the inside of any of this equipment, it shall be thoroughly flushed with water and purged of hazardous gases.

(e) Respiratory protective equipment approved for use in chlorine and chlorine dioxide exposures shall be provided at appropriate locations.

(f) Facilities handling sodium chlorate and chlorine dioxide shall be declared "no smoking" areas and shall have signs posted accordingly.

(g) Management shall be responsible for developing written instructions including safety procedures for operating and maintaining the generator and associated equipment. All personnel working on this equipment shall be thoroughly trained in these procedures and shall follow them. A periodic review of these procedures is recommended.

[Order 74-24, § 296-79-29033, filed 5/6/74.]

**WAC 296-79-29035 Piling and unpling pulp. (1) Piles of wet lap pulp (unless palletized) shall be stepped back one-half the width of the sheet for each 8 feet of pile height. Sheets of pulp shall be interlapped to make the pile secure. Pulp shall not be piled over pipelines to jeopardize pipes, or so as to cause overloading of floors, or to within 18 inches below sprinkler heads.**

(2) Piles of pulp shall not be undermined when being unpled.

(3) Floor capacities shall be clearly marked on all floors.

(4) Baled paper and rags shall be stored in stable piles which do not extend into the area necessary for the proper function of sprinkler systems, where sprinklers are used for fire protection in the storage area.

[Order 76-7, § 296-79-29035, filed 3/1/76; Order 74-24, § 296-79-29035, filed 5/6/74.]

**WAC 296-79-29037 Chocking rolls. (1) Where pulp or paper rolls are of uniform size, cribbing should be constructed to keep rolls from moving.**

(2) Where rolls are stacked and not nested two or more high, chocks shall be installed between each roll on the floor and at every row. The face of each chock should be formed on a radius to conform to the average roll size in use, and the chock shall prevent roll movement.

(3) When rolls are decked two or more high, the bottom rolls shall be chocked on each side to prevent shifting in either direction.

(4) A supply of portable roll chocks should be available to be used where there are gaps in the bottom row of rolls. These should be as light as possible while still providing maximum blocking effect.

[Order 74-24, § 296-79-29037, filed 5/6/74.]

**WAC 296-79-300 Machine room equipment and procedures.** (1) Lock-out and tag-out procedures to be followed. Lock-out and tag-out requirements and procedures contained in these standards shall be complied with.

(2) Emergency stopping controls. Pulp and paper machines shall be equipped with emergency stopping control(s) which can be actuated quickly from all normal operating stations. If useful for the safety of personnel, the stopping control(s) shall be interlocked with adequate retarding or braking action to stop the machine as quickly as is practical.

(3) Walkways. Steps and footwalks along the four-drier and press section shall have nonslip surfacing and be complete with standard handrails, when practical.

(4) Machine lubrication. If a machine must be lubricated while in operation an automatic lubricating device shall be provided or oil cups and grease fittings shall be provided which can be serviced safely without exposing the worker to any hazards.

(5) Weights on levers. All levers carrying weights shall be so constructed that weights will not slip or fall off.

(6) Guarding inrunning nip points.

(a) The drums on pulp and paper machine winders shall be provided with suitable guards to prevent a person from being caught between the roll and the front drum on the winder when the pinch point is on the operator's side. Any such guard shall be interlocked with the drive mechanism to prevent the winder from running while the guard is not in place except that the winder may be wired to allow it to run at a slow speed only for adjustment and start-up purposes while the guard is not in position. A zero speed switch or locking device shall be installed to prevent the guard from being removed while the roll is turning.

Paper machine winders when used to produce rolls of 15 inches or less in diameter may be exempted from this subsection but must comply with the provisions of (6)(b).

(b) Rewinders.

(i) When rewinding large rolls and the nip point is adjacent to the normal work area, the nip point shall be protected by a barrier guard. Such guard shall be interlocked with the drive mechanism to prevent operating the machine above jog speed without the guard in place. A zero speed switch shall be installed to prevent the guard from being raised while the roll is turning.

(ii) On small rolls 15 inches or less in diameter where barrier guards are impractical they shall not be required if the nip point is separated from the employees by at least 18" while operating at more than jog speed. When the rewinder is running at more than jog speed no worker shall place any part of his body closer than 18" from the nip.

(c) Inrunning nips where paper is not being fed into a calender should be protected by barriers.

(7) Audible alarm in dryer section. An audible alarm shall be sounded prior to starting up any section of a

pulp or paper machine. Sufficient time shall be allowed between activation of the alarm system and start-up of the equipment to allow any persons to clear the hazardous area.

(8) Starting up dryer section. In starting up a dryer section, steam to heat the drums shall be introduced slowly and while the drums are revolving.

(9) Starting paper into nip. When starting paper into the nip of drum type reels or calender stacks a safe method shall be used. This may be accomplished by the use of feeder belts, carrier ropes, air carriage or other device or instrument. A rope carrying system should be used wherever possible at points of transfer. Sheaves should be spaced so that they do not create a nip point with each other and the sheave and its support should be capable of withstanding the speed and breaking strength of the rope for which they are intended.

(10) Feeding stack with hand held device. Employees shall not feed a stack with any hand held device which is capable of going through the nip.

(11) Broken carrier rope. Employees shall not attempt to remove a broken carrier rope from a dryer while the section is running at operating speed.

(12) Removing a wrap. Employees shall stop dryer to remove a wrap except in cases where it can be safely removed by using air or other safe means.

(13) Deposits on rolls. To remove deposits from rolls, a specially designed scraper or tool shall be used. Scraping of rolls shall be performed on the outgoing nip side.

(14) Cleaning doctor blades. Employees shall not place their hands between the sharp edge of an unloaded doctor blade and the roll while cleaning the doctor blade.

(15) Sharp edges of doctor blades to be covered. Doctor blades shall have the sharp edges properly guarded during transportation and storage.

(16) Handling doctor blades. Special protective gloves shall be provided and shall be worn by employees when filing or handling sharp edged doctor blades.

(17) Steps, platforms or walkways for calender stacks. When steps, platforms, or walkways are necessary to perform work on calender stacks they shall have nonskid type surfaces. Guardrails shall be installed where possible.

(18) Lifting reels.

(a) Reels shall stop rotating before being lifted away from reel frame.

(b) All lifting equipment (clamps, cables, and slings) shall be maintained in a safe condition and inspected regularly.

(c) Exposed rotating reel shafts with square block ends shall be guarded.

(19) Reels to be properly seated. The crane operator shall ascertain that reels are properly seated at winder stand or at reel arms before he disengages the hooks.

(20) Space between reels. On stack reels, a clearance of at least 8 inches between the reels of paper shall be maintained.

(21) Set screws. Set screws for securing core collars to winding and unwinding shafts shall not protrude above

the face of the collar. All edges of the collar that an operator's hand may come in contact with shall be beveled to remove all sharp corners.

(22) Properly set up core cutting device. The worker shall make certain that any core cutting device is properly set up and guard is in proper position before using the machine.

(23) Winder shaft. All winder shafts should be equipped with a winder collar guide. The winder should have a guide rail to align the shaft for easy entrance into the opened rewind shaft bearing housing. If winder shafts are too heavy for manual handling, mechanical equipment shall be used.

(24) Barrier guards for shaftless winders. Shaftless winders shall be provided with a barrier guard of sufficient strength and size to confine the rolls in the event they become dislodged while running.

(25) Grounding. All calender stacks and spreader bars shall be grounded as protection against shock induced by static electricity.

(26) Sole plates. All exposed sole plates between dryers, calenders, reels and rewinders shall have a nonskid type surface.

(27) Nonskid type surface required. A nonskid type surface shall be provided in the work areas around the winders or rewinders. Areas in front of the winder shall be kept clear of oil, broke, and other debris that may cause workers to slip, trip, or fall.

(28) Roll lowering table. If a powered roll ejector is used it should be interlocked to prevent accidental actuation until the receiving platform or roll lowering table is in position to receive the roll.

(29) Lowerator. Employees shall keep clear of hazardous areas around the lowerator, especially all lowerator openings in a floor and where roll is being discharged.

(30) Rider rolls. Provision shall be made to hold the rider roll when in a raised position unless counterbalancing eliminates the hazard.

(31) Gas hood entry procedures. Whenever an employee is inside a gas hood he shall be accompanied by another worker or a person shall be stationed near the entrance.

(32) Drain openings in pits. Flush floor drain openings larger than 3" in diameter in the bottom of pits shall be guarded to prevent workers from stepping through, while working in this area.

[Statutory Authority: RCW 49.17.040, 49.17.240, and chapters 43.22 and 42.30 RCW. 81-03-007 (Order 80-31), § 296-79-300, filed 1/8/81; Order 76-7, § 296-79-300, filed 3/1/76; Order 74-24, § 296-79-300, filed 5/6/74; Order 70-6, § 296-79-300, filed 7/10/70, effective 8/10/70.]

**WAC 296-79-310 Converting operations (bag and container manufacturing, printing, coating, finishing and related processes)—Scope and application.** All sections of this chapter which include WAC 296-79-310 in the section number apply to converting operations (bag and container manufacturing, printing, coating, finishing and related processes).

[Order 74-24, § 296-79-310, filed 5/6/74; Order 70-6, § 296-79-310, filed 7/10/70, effective 8/10/70.]

[Title 296 WAC—p 1730]

**WAC 296-79-31001 General requirements.** (1) Applicable rules of this standard to prevail. Rules contained in this standard shall prevail where applicable to converting operations.

(2) Use of both hands required to activate guillotine trimmers. Guillotine-type trimmers shall be designed in a manner which will require the operator to use both hands simultaneously to activate the cutting blade. If machine helpers are employed in the control function of the cutter, separate two-hand controls shall be provided for the control function performed by the helper.

(3) Nonrepeat device required for guillotine trimmers. Guillotine-type trimmers shall be designed in a manner that the trimming blade will not repeat unless manually reactivated.

(4) Sorting and counting tables. Tables shall be smooth and free from splinters, with edges and corners rounded.

(a) Paddles shall be smooth and free from splinters.

(5) Mirrors should be installed to assist the converting machine operator in viewing blind work stations where a hazard exists.

(6) Mechanical lifting devices shall be provided for placing and removing rolls from rewinders. Rolls shall not be left suspended overhead while the controls are unattended.

(7) Rolls handled by cranes or hoists shall not be handled over the heads of workers.

(8) When using a crane or hoist to place rolls into a backstand and the operator cannot see both ends of the backstand, assistance will be provided or appropriate devices will be installed to eliminate the hazards involved. The operator shall ascertain that rolls are properly seated at winder stand or at roll arms before he disengages the hooks.

(9) Slitters, slotters, and scorers not in use shall be properly stored as not to create a hazard.

(10) All power closing sections shall be equipped with an audible warning system which will be activated when closing the sections.

(11) Roll-type embosser. The nipping point located on the operator's side shall be guarded by either automatic or manually operated barrier guards interlocked with the drive.

[Order 76-7, § 296-79-31001, filed 3/1/76; Order 74-24, § 296-79-31001, filed 5/6/74.]

**WAC 296-79-31003 Corrugator.** (1) Every recessed floor conveyor system shall be identified by standard color coding, and so designed and installed to minimize tripping hazards.

(2) All areas subject to wet processes shall be provided with drains.

(a) Drain trenches shall be provided with gratings flush with the adjoining floor.

(b) Use of curbing in work areas should be avoided in new installations. If the use of curbing cannot be avoided, the design shall be such that the curbs do not constitute a tripping hazard in normal working areas. When curbing exists and constitutes a hazard, it shall be color coded.

(3) Rails of rail mounted devices such as roll stands shall be flush with the adjacent floor, and so installed to provide a minimum of 18" clearance between the equipment and walls or other fixed objects.

(4) All corrugating and pressure rolls shall be equipped with appropriately designed and installed threading guides so as to prevent contact with the infeed nip of the various rolls by the operator.

(5) A minimum of 4" clearance shall be maintained between heated drums, idler rolls, and cross shafting on all preheaters and preconditioners.

(6) Lower elevating conveyor belt rolls on the single facer bridge shall have a minimum nip clearance of 4".

(7) Web shears at the discharge end of the double facer shall be equipped with barrier type guards.

(8) Slitter stations not in use shall be disconnected from the power source by positive means.

(9) Elevating type conveyors shall have the floor area color-coded.

[Order 74-24, § 296-79-31003, filed 5/6/74.]

**WAC 296-79-31005 Adhesive system.** (1) The adhesive system shall be so designed and installed as to keep fumes and airborne dust within limits set by the occupational health standards, chapter 296-62 WAC.

[Order 74-24, § 296-79-31005, filed 5/6/74.]

**WAC 296-79-31007 Printing and cutting.** (1) Printer slotter.

(a) The in-feed nip shall be guarded to prevent contact with the in-running feed rolls. Shear and pinch points at the feed mechanism shall be color-coded and/or identified by signs.

(b) Employees shall wear eye protection while removing staples from the dies or while adjusting slotter knives.

[Order 74-24, § 296-79-31007, filed 5/6/74.]

**WAC 296-79-31009 Die cutting.** (1) Bobst type die cutters.

(a) The space where the sheet enters the die shall be guarded to prohibit entry of the operator's hand. If this guard is hinged or otherwise moveable it shall be interlocked to prevent the equipment from moving unless the guard is in the proper position.

(b) A minimum of 4" shall be provided between the end of the slat and the guide bar.

[Order 74-24, § 296-79-31009, filed 5/6/74.]

**WAC 296-79-31011 Power lifts on gluers, tapers and stitchers.** (1) Elevated operator stands for lifts shall have toe boards on three sides.

[Order 74-24, § 296-79-31011, filed 5/6/74.]

**WAC 296-79-31013 Strapping-banding operations.**

(1) Eye protection shall be worn when hand strapping or breaking bands.

[Order 74-24, § 296-79-31013, filed 5/6/74.]

(1989 Ed.)

**WAC 296-79-320 Recovery furnace area requirements.** (1) Warning system. An audible warning system shall be installed in kraft and soda base sulfite recovery furnace areas and shall be actuated whenever an emergency exists.

(2) Personnel to be instructed in emergency procedures. All personnel working in recovery furnace areas shall be instructed on procedures to be followed when emergency warning systems are actuated.

(3) Warning system maintenance. Emergency warning systems in the recovery furnace areas shall be kept in proper working condition and shall be tested or checked weekly.

(4) Personnel to stand to side while opening firebox door. Personnel shall stand to the side while opening a furnace or boiler firebox door.

(5) Smelt tanks. Smelt-dissolving tanks shall be covered and the cover kept closed, except when samples are being taken.

[Order 74-24, § 296-79-320, filed 5/6/74; Order 70-6, § 296-79-320, filed 7/10/70, effective 8/10/70.]

### Chapter 296-81 WAC

## SAFETY RULES GOVERNING EXISTING ELEVATORS, DUMBWAITERS, ESCALATORS AND OTHER LIFTING DEVICES—MOVING WALKS

### WAC

296-81-005	National Elevator Codes adopted.
296-81-006	National Elevator Code adopted—1967.
296-81-007	National Elevator Code adopted.
296-81-008	National Elevator Code supplement adopted.
296-81-009	National Safety Standard for Manlifts adopted.

### EXISTING INSTALLATIONS

296-81-010	Hoistway enclosures.
296-81-020	Hoistway gates and doors.
296-81-030	Car enclosures.
296-81-040	Car doors and gates.
296-81-050	Brakes.
296-81-060	Car safeties.
296-81-070	Overspeed governors.
296-81-080	Periodic inspections and tests.
296-81-090	Maintenance inspection and test periods.
296-81-100	Ropes, rope connections, data and record.
296-81-110	Electric and electro-hydraulic dumbwaiters.
296-81-120	Hydraulic elevators.
296-81-130	Sidewalk elevators.
296-81-140	Hand power elevators and dumbwaiters.
296-81-150	Car operating and terminal stopping devices and electrical protective devices.
296-81-160	Power supply switch.
296-81-170	Access to machine room and machinery space.
296-81-180	Capacity posting.
296-81-190	Illumination.
296-81-200	Adoption of elevator codes.
296-81-220	Illumination of pits.
296-81-240	Valves.
296-81-260	Photo electric or electric eye devices.
296-81-270	Counterweight pit guards.
296-81-275	Smoke detectors.
296-81-277	Method to achieve ANSI A17.1-102.2 (c)4.
296-81-300	Operation and leveling.
296-81-305	Door operation.
296-81-310	Door delay.
296-81-315	Car interior.
296-81-320	Car controls.
296-81-325	Car position indicator signal.

[Title 296 WAC—p 1731]

296-81-330	Telephone or intercommunicating system.
296-81-335	Floor covering.
296-81-340	Handrails.
296-81-345	Minimum illumination.
296-81-350	Door jam marking.
296-81-355	Hall buttons.
296-81-360	Hall lantern.
296-81-365	Emergency use.
296-81-370	Effective date.
296-81-990	Advisory board.
296-81-991	Civil penalties.

**Reviser's note:** As a part of Order 70-11, filed 9/18/70, effective date 10/21/70, the administration of chapter 296-81 WAC, Safety rules governing elevators, dumbwaiter, escalator and other lifting devices—Moving walks shall be under the jurisdiction of the division of building and construction safety inspection services of the department of labor and industries.

#### DISPOSITION OF SECTIONS FORMERLY CODIFIED IN THIS CHAPTER

296-81-002	Foreword. [Foreword, filed 9/28/64.] Repealed by 82-12-005 (Order 82-18), filed 5/20/82. Statutory Authority: RCW 70.87.030.
296-81-003	Waiver and variance. [Waiver and variance, filed 9/28/64.] Repealed by 82-12-005 (Order 82-18), filed 5/20/82. Statutory Authority: RCW 70.87.030.

#### WAC 296-81-005 National Elevator Codes adopted.

(1) American Standard Safety Code for Elevators, Dumbwaiters and Escalators A 17.1 1960 shall apply to all elevators, dumbwaiters, and escalators installed between November 1, 1963, and December 29, 1967.

(2) American Standard Safety Code Rules for Moving Walks A.S.A. 17.1.13 1962 shall apply to all moving walks installed between November 1, 1963, and December 29, 1967.

(3) Part X of A.S.A. A17.1 1960 Maintenance shall apply to installations in existence on November 1, 1963.

[Statutory Authority: RCW 70.87.030. 82-12-005 (Order 82-18), § 296-81-005, filed 5/20/82. Prior: Effective 11/1/63.]

**WAC 296-81-006 National Elevator Code adopted—1967.** USAS Standard A 17.1-1965 "Safety Code for Elevators, Dumbwaiters, Escalators and Moving Walks" (Revision and Consolidation of A17.1-1-1960, A17.1a-1963, and A17.1-13-1962) plus Supplement USAS-A17.1a-1967, USAS A17.1b-1968, USAS A17.1c-1969 (excluding Appendix E) and ANSI A17.1d-1970 shall apply to all elevators, dumbwaiters, escalators, and moving walks installed from December 30, 1967, through February 24, 1972.

[Statutory Authority: RCW 70.87.030. 82-12-005 (Order 82-18), § 296-81-006, filed 5/20/82; Order 70-11, § 296-81-006, filed 9/18/70; filed 12/29/67.]

**Reviser's note:** The A.S.A. publications are published by the American Society of Mechanical Engineers at 345 47th Street, New York, New York 10017.

#### WAC 296-81-007 National Elevator Code adopted.

(1) The American National Standard Safety Code for Elevators, Dumbwaiters, Escalators and Moving Walks, American National Standards Institute A17.1, as amended or revised through 1971, is adopted as the standards in this state for elevators, dumbwaiters, escalators, and moving walks installed from February 25, 1972, through June 30, 1982.

(2) The American National Standard Safety Code for Elevators, Dumbwaiters, Escalators, and Moving Walks, ANSI A17.1, 1981 edition, is adopted as the standard for elevators, dumbwaiters, escalators, and moving walks installed on or after July 1, 1982 through January 9, 1986.

(3) The American National Standard Safety Code for Elevators, Dumbwaiters, Escalators, and Moving Walks, ANSI A17.1, 1984 edition is adopted as the standard for elevators, dumbwaiters, escalators, and moving walks installed on or after January 10, 1986, with the exception of ANSI A17.1, part XIX. For all elevators, dumbwaiters, escalators, and moving walks installed on or after November 1, 1988, the requirements of ANSI A17.1, 1984 edition apply, with the exception of ANSI A17.1, part XIX and ANSI A17.1, part II, Rule 211.3b, which is replaced by WAC 296-81-275.

(4) The American National Standard Safety Code for Elevators, Dumbwaiters, Escalators, and Moving Walks, ANSI A17.1, 1987 edition is adopted as the standard for elevators, dumbwaiters, escalators, and moving walks installed on or after January 1, 1989, with the exception of ANSI A17.1, part XIX, and ANSI A17.1, part II, Rule 211.3b, which is replaced by WAC 296-81-275.

[Statutory Authority: RCW 70.87.080, 70.87.090 and 70.87.100. 88-19-053 (Order 88-18), § 296-81-007, filed 9/15/88. Statutory Authority: RCW 70.87.030. 87-23-007 (Order 87-21), § 296-81-007, filed 11/6/87. Statutory Authority: RCW 70.87.080, 70.87.090 and 70.87.100. 86-03-024 (Order 86-1), § 296-81-007, filed 1/10/86. Statutory Authority: RCW 70.87.030 and 70.87.185. 84-23-001 (Order 84-21), § 296-81-007, filed 11/8/84. Statutory Authority: RCW 70.87.185 and 70.87.034. 84-05-005 (Order 83-37), § 296-81-007, filed 2/6/84. Statutory Authority: RCW 70.87.030. 82-12-005 (Order 82-18), § 296-81-007, filed 5/20/82; Order 72-2, § 296-81-007, filed 2/25/72.]

**WAC 296-81-008 National Elevator Code supplement adopted.** (1) The American National Standard Supplement to Safety Code for Elevators, Dumbwaiters, Escalators and Moving Walks, A17.1-1971, ANSI A17.1a-1972 is hereby adopted as additional standards for compliance in this state for elevators, dumbwaiters, escalators, and moving walks installed from February 25, 1972, through June 30, 1982, and by this reference such standards are incorporated herein as though fully set forth. Copies of this supplement may be obtained from The American Society of Mechanical Engineers, 345 East 47th Street, New York, New York 10017.

(2) The 1981 edition of ANSI A17.1 is supplemented by the ANSI A17.1a - 1982 supplement for elevators, dumbwaiters, escalators, and moving walks installed on or after March 1, 1984, through January 9, 1986. The 1981 edition of ANSI A17.1 and ANSI A17.1a - 1982 is supplemented by ANSI A17.1b - 1983 for elevators, dumbwaiters, escalators, and moving walks installed on or after December 1, 1984, through January 9, 1986, with the exception of portable escalators covered by Part VIII of ANSI A17.1b - 1983.

(3) The 1984 edition of ANSI A17.1 is supplemented by the ANSI A17.1a - 1985 supplement for elevators, dumbwaiters, escalators, and moving walks installed on or after January 10, 1986.



(4) The 1984 edition of ANSI A17.1 is supplemented by ANSI A17.1b - 1985, ANSI A17.1c - 1986, ANSI A17.1d - 1986, and ANSI A17.1e - 1987 for elevators, dumbwaiters, escalators, and moving walks installed on or after December 6, 1987.

[Statutory Authority: RCW 70.87.080, 70.87.090 and 70.87.100. 88-07-101 (Order 88-02), § 296-81-008, filed 3/23/88. Statutory Authority: RCW 70.87.030. 87-23-007 (Order 87-21), § 296-81-008, filed 11/6/87; 82-12-005 (Order 82-18), § 296-81-008, filed 5/20/82; Order 76-37, § 296-81-008, filed 12/3/76; Order 74-31, § 296-81-008, filed 6/14/74.]

**WAC 296-81-009 National Safety Standard for Manlifts adopted.** The USA Safety Standard for Manlifts, USAS A90.1-1969, is hereby adopted as the standards for compliance in this state for belt manlifts, and by this reference such standards are incorporated herein as though fully set forth. Copies of these standards may be obtained from the American Society of Mechanical Engineers, United Engineering Center, 345 East 47th Street, New York, New York 10017.

[Order 74-31, § 296-81-009, filed 6/14/74.]

### EXISTING INSTALLATIONS

**WAC 296-81-010 Hoistway enclosures.** (1) Local laws and ordinances shall govern the fire-resistive requirements for the hatchway enclosures.

(2) Where doors and hoistway enclosures are not required to be fire resistant, the hoistway shall be enclosed with material, which may be solid or with openings that do not exceed one-half inch in diameter, to a height of six feet above each floor or landing and above the treads of adjacent stairways.

(3) Enclosures shall be so supported and braced as to deflect not over one inch when subjected to a force of one hundred pounds applied perpendicularly at any point. Adjacent to the counterweights, the enclosure must extend the full height of the floor and extend six inches past the counterweight raceway.

[Statutory Authority: RCW 70.87.080, 70.87.090 and 70.87.100. 86-03-024 (Order 86-1), § 296-81-010, filed 1/10/86; Rules 1.010-1.050, filed 9/28/64.]

**WAC 296-81-020 Hoistway gates and doors.** (1) Freight elevator landing openings shall be provided with manually or power operated gates or doors at each landing, guarding the full width of the opening. Gates and doors shall conform to the following requirements:

(a) Balanced type vertically sliding hoistway gates shall extend from a point not more than two inches from the landing threshold to a point not less than sixty-six inches above the landing threshold. Gates shall be solid or shall be openwork of a design to reject a ball two inches in diameter and shall be so located that the distance from the hoistway face of the gate to the hoistway edge of the landing sill shall be not more than two and one-half inches. Gates shall be constructed of metal or wood and shall be so designed and guided that they will withstand a lateral pressure of one hundred pounds applied at approximately their center without breaking or being permanently deformed and without displacing the

gate from its guides or tracks. Where handline operations are used, an opening in the hoistway door or gate will be permitted providing it is at least thirty inches from the floor and is not over five inches in width and not more than thirty-six inches high.

(2) Hoistway doors shall be of the vertically sliding, biparting counter-balanced type or of the horizontally swinging or sliding type.

(a) Hoistway gates or doors of electric or electro-hydraulic elevators shall be equipped with an approved type combination electric contact and mechanical lock or an approved type hoistway door interlock which shall prevent operation of the elevator by the normal operating devices unless the door or gate is closed or is locked in the closed position, providing that where the rated speed of the elevator exceeds one hundred and fifty feet per minute hoistway door interlocks shall be provided.

(b) Power door or gate operating devices, if provided, shall be of a type and design approved by the enforcing agency.

(3) Every existing passenger elevator entrance shall be equipped with hoistway doors, and hoistway door interlocks.

(4) Where hoistway doors at all landings are equipped with mechanical unlocking devices, they shall conform to the following:

(a) The device shall be designed to prevent unlocking the door with common tools.

(b) The operating means for unlocking the door shall be available to and used only by inspectors, maintenance men, and repair men.

(5) Installation of hoistway door unlocking devices may be made on hoistway doors of power elevators subject to the following provisions:

(a) The elevator shall have hoistway doors which are unlocked when closed with the car at floor, or locked but openable from landing by means effective only when car is in landing zone.

(b) The operating means for unlocking the door shall be mounted in a receptacle with a breakable, transparent cover clearly marked in letters at least one eighth inch high: ELEVATOR DOOR KEY FOR FIRE DEPARTMENT AND EMERGENCY USE ONLY.

(c) The receptacle shall be located at the bottom landing.

(6) Where automatic operation elevators with swinging doors have clearance greater than two and one-half inches between the inside face of the hoistway door and the hoistway edge of the threshold, the hoistway door shall be equipped with an extension panel on the lower portion of the door extending up at least thirty-six inches above the bottom of the door and having the inside face of this panel within two and one-half inches of the line of the threshold when the door is closed and the top surface of this panel shall be beveled at not less than sixty degrees from the horizontal.

[Rules 2.010-2.060, filed 9/28/64.]

**WAC 296-81-030 Car enclosures.** Car enclosures for freight and passenger cars shall conform with the following:



(1) Freight elevator cars shall be enclosed to a height of at least six feet from the floor on all sides, where there are no hoistway doors or gates, with solid panel or openwork which will reject a two inch ball. On the side of the car adjacent to the counterweight runway and extending six inches each side of the counterweight runway, the enclosure shall extend to the car top or underside of car crosshead. Overhead protection of solid or openwork material: If openwork, it shall reject a one and one-half inch ball and shall be sufficiently strong to support three hundred pounds applied at any point. Simultaneous application of these loads is not required. Suitable overhead protection may be installed directly over the area where the operator runs the controls, providing the overhead protection covers sufficient area for safe protection of operator.

(2) Passenger elevator cars shall be fully enclosed on all sides and the top, except the opening for entrances. It shall be of metal or wood in conformity with the local fire regulations. The car top shall be capable of sustaining a load of three hundred pounds on any square area of two feet on a side and one hundred pounds applied at any point. Simultaneous application of these loads is not required.

[Rule 3.010, filed 9/28/64.]

**WAC 296-81-040 Car doors and gates.** (1) Car doors or gates shall be required at each entrance to the elevator car.

(2) Car doors or gates may be horizontal or vertical sliding.

(3) Gates, except collapsible, may be solid or may be openwork of a design to reject a ball two inches in diameter. Gates shall be constructed of metal or wood and shall be so designed that they will withstand a lateral pressure of one hundred pounds applied at approximately their center without breaking or being permanently deformed and without displacing the gate from its guides or tracks.

(4) Collapsible gates shall reject a three inch diameter ball when fully extended (closed position) when installed on passenger cars and shall reject a four and one-half inch ball when fully extended (closed position) when installed on freight cars. Such gates shall not be power opened for more than one-third of their clear opening distance or for a maximum power opening distance not to exceed ten inches. Collapsible gates shall have at least every fourth vertical member guided at the top and every second vertical member guided at the bottom.

(5) Car doors and gates when in the fully closed position shall conform to the following:

(a) For passenger cars they shall protect the full width and height of the car entrance opening provided that vertically sliding gates may extend from a point not more than one inch above the car floor to a point not less than six feet above the floor.

(b) For freight elevators they shall protect the full width of the car entrance opening. Car doors shall extend from the car floor to a height of not less than six feet above the car floor. Vertically sliding gates shall extend from a point not more than one inch above the

car floor to a point not less than six feet above the car floor.

(6) Car doors and gates of electric and electro-hydraulic elevators shall be equipped with approved car door or gate electric contacts which will prevent operation of the elevator by the normal operating device unless the car door or gate is in the closed position.

[Order 74-31, § 296-81-040, filed 6/14/74; Rules 4.010-4.060, filed 9/28/64.]

**WAC 296-81-050 Brakes.** All electric elevators shall be equipped with effective brakes that are released electrically and applied by springs. The brakes shall be designed to have a capacity sufficient to hold the car at rest with its rated load. At least one brake shall be mounted on the driving machine worm shaft. Exceptions to this rule may be made by the enforcing agency if an impractical condition is encountered, providing other safe means are provided.

[Rule 5.010, filed 9/28/64.]

**WAC 296-81-060 Car safeties.** The car of every elevator suspended by wire ropes shall be provided with car safeties as hereinafter defined. The safety device shall be capable of stopping and sustaining the entire car with its rated load in the event of cable severance or overspeed. There shall be a switch provided on the car actuated by the setting of the safeties that will remove the electric power from the driving machine motor and brake. Car safety devices (safeties) are identified and classified on the basis of performance characteristics after the safety begins to apply pressure on the guide rails.

(1) **Type A safeties.** Safeties which develop a rapidly increasing pressure on the guide rails during the stopping interval, the stopping distance being very short due to the inherent design of the safety. The operating force is derived entirely from the mass and the motion of the car or the counterweight being stopped. These safeties apply pressure on the guide rails through eccentrics, rollers, or similar devices without any flexible medium purposely introduced to limit the retarding force and increase the stopping distance.

(2) **Type B safeties.** Safeties which apply limited pressure on the guide rails during the stopping interval, and which provide stopping distances that are related to the mass being stopped and the speed at which application of the safety is initiated. Retarding forces are reasonably uniform after the safety is fully applied. Continuous tension in the governor rope may or may not be required to operate the safety during the entire stopping interval. Minimum and maximum distances are specified on the basis of governor tripping speed.

(3) **Type C safeties (Type A with oil buffers).** Safeties which develop retarding forces during the compression stroke of one or more oil buffers interposed between the lower members of the car frame and a governor-operated type A auxiliary safety plank applied on the guide rails. The stopping distance is equal to the effective stroke of the buffers.

(4) **Type G safeties.** Safeties similar to type B except having a gradually increasing retarding force. This

safety may be either of the wedge clamp type or the flexible guide clamp type applied by a cable which unwinds a drum below the car floor.

(5) **Slack rope safeties that are actuated by the slackening or breaking of the hoisting ropes.** This type of safety is not actuated by an overspeed governor.

[Rule 6.010, filed 9/28/64.]

**WAC 296-81-070 Overspeed governors.** A speed governor or inertia trip safety or a slack cable operated safety shall be installed on all elevators except hydraulic elevators and shall be so designed that it will actuate the car safeties before the car attains a speed of one hundred and forty percent of the rated speed. Governor ropes shall be not less than three-eighths inch in diameter, if iron or steel rope, and not less than three-quarter inch manila rope. Tiller rope shall not be used.

[Rule 7.010, filed 9/28/64.]

**WAC 296-81-080 Periodic inspections and tests.**

(1) Periodic inspections shall be made of all existing installations at regular intervals to determine that the equipment is in a proper operating condition and in conformity with these rules.

(2) The owner or his authorized agent shall cause periodic tests to be made by a person qualified to perform such service and a report indicating the date of inspection with all pertinent data included, which shall be sent to the supervisor of the division of safety.

(3) All parts of the equipment including all safeties, governors, and oil buffers shall be inspected at twelve month intervals, and when necessary tested to determine that they are in a proper operating condition and that parts subject to wear, such as ropes, bearings, gears, car safety, guide rails and fastenings, and governor parts, oil buffers, etc., have not worn or become defective to such an extent as to affect the proper operation of the equipment or installation. Any such worn or defective equipment or part shall be adjusted, repaired or replaced.

[Rules 8.010-8.030, filed 9/28/64.]

**WAC 296-81-090 Maintenance inspection and test periods.** Tests of elevator car and counterweight safeties, governors, and oil buffers shall be made at intervals not exceeding five years. The owner or his authorized agent shall have these tests made in lieu of one of the periodic inspections and tests. The car safety, counterweight safety where provided, and the governor shall be subjected to inspections and tests as follows:

(1) Type A safeties and Type A safety parts of Type C safeties shall, prior to the safety tests, be inspected and the safety operated by hand to determine that:

(a) They are in a proper operating condition and in conformity with the requirements as set forth in Rule 8.030.

(b) Following hand operation the safety rollers or dogs operate simultaneously and have approximately the same travel.

(c) There is sufficient remaining travel of the rollers of dogs to bring the car and its rated load to rest from

(1989 Ed.)

rated speed. The safety tests for Type A, B, and C shall be made with the rated load in the car by tripping the governor by hand at rated speed. The tests shall also specify the stopping distances. A metal or plastic tag shall be attached to the safety-releasing carrier in a permanent manner, giving the date of the safety test together with the name of the person or firm who performed the test.

[Rule 9.010, filed 9/28/64.]

**WAC 296-81-100 Ropes, rope connections, data and record.** (1) Elevator cars of electric and roped hydraulic elevators shall be suspended by steel wire ropes. Only iron (low carbon steel) or steel wire ropes with fibre cores, having the commercial classification of "elevator wire rope," shall be used for the suspension of elevator cars and for the suspension of counterweights.

(2) The minimum number of hoisting ropes used shall be three for traction elevators and two for drum type elevators.

(3) Hoisting chains where permitted on double car units, shall comply with the chain manufacturer's specifications as to maintenance and inspection. The operation of these units must be by remote control, and no one shall be allowed to ride on the cars at any time.

(4) The car and counterweight ends of car and counterweight wire ropes, or the stationary hitch ends where multiple roping is used shall be fastened in such a manner that the looped ends of the turned back portion in the rope sockets shall be readily visible.

Fastenings shall be:

(a) By individual tapered babbitted rope sockets or,

(b) By other types of rope fastenings that meet the approval of the enforcing agency.

(5) The rope sockets shall be of a type which will develop at least eighty percent of the breaking strength of the strongest rope to be used in such fastenings, and U-bolt type rope clips (clamps) shall not be used for load line fastenings.

(6) A metal or plastic data tag shall be securely attached to one of the wire rope fastenings each time the ropes are renewed or reshackled. This data tag shall bear the following information:

(a) Name of rope manufacturer.

(b) The diameter in inches.

(c) The manufacturer's rated breaking strength.

(d) The month and year the ropes were installed.

(e) Whether nonperformed or performed.

(f) Name of the person or firm who installed ropes.

[Rules 10.010-10.060, filed 9/28/64.]

**WAC 296-81-110 Electric and electro-hydraulic dumbwaiters.** (1) Dumbwaiter cars may be constructed of metal or wood and shall be in compliance with local ordinances as to fire resistivity providing it is constructed to carry its rated load without distortion. The dumbwaiter car must be fully enclosed except for the landing sides. The car floor shall not exceed nine square feet in area and the total inside height shall not exceed four feet and the maximum capacity shall not exceed five hundred pounds. The fire resistance rating for the

[Title 296 WAC—p 1735]

hoistway and hoistway doors shall conform with the local area fire ordinances where required. Hoistway doors shall be installed at each hoistway opening. Hoistway doors shall be equipped with electric contacts and mechanical locks.

(2) Electrically operated machines shall be equipped with brakes that are electrically released and applied automatically by springs in conformity with the requirements set forth in WAC 296-81-050(1).

(3) Dumbwaiters equipped with winding drum machines having a travel of more than thirty feet and a rated load of more than one hundred pounds, shall be equipped with a slack rope switch which will automatically remove the power from the motor and brake when the hoisting ropes become slack.

[Rules 11.010-11.030, filed 9/28/64.]

**WAC 296-81-120 Hydraulic elevators.** All hydraulic elevators shall be equipped with electrically operated anti-creep leveling devices.

[Order 74-31, § 296-81-120, filed 6/14/74; Rule 12.010, filed 9/28/64.]

**WAC 296-81-130 Sidewalk elevators.** Electrically operated sidewalk elevators shall be in conformity with the following requirements:

(1) Where the top opening is located in the sidewalk or other area exterior to the building, all electrical equipment on the car or in the hoistway shall be weatherproof. The operation of power sidewalk elevators through openings in the sidewalk, or through openings in other exterior areas which are protected by hinged doors or vertically lifting covers, shall conform to the following:

(a) The elevator shall be operated in both the up and down directions through the opening, only from the sidewalk or other exterior area. The operation shall be by means of:

(i) Key-operated continuous-pressure type, up and down switches, or

(ii) Continuous-pressure-type up-and-down operating buttons on the free end of a detachable, flexible cord five feet or less in length.

(iii) Continuous-pressure-type up-and-down operating buttons may be installed on the elevator car providing the control is so designed that the buttons will not function unless the sidewalk doors are locked in the open position and that a safety screen that will open and close with the car is installed.

(b) Key-operated switches shall be of continuous-pressure spring-return type, with the key removable only when the switch is in the off position.

(2) A sidewalk elevator that derives its power directly from city water mains, and that is controlled by a manually operated three position valve may be operated by a handline providing that a device is permanently installed on the hand line that will stop the car in the up direction before the bow iron on the car comes in contact with the sidewalk doors. The device must be so designed that it will not deflect or become deformed under a minimum stress of one hundred fifty pounds. There also must be

installed over the sidewalk area a substantial screen that will open and close with the car when the sidewalk doors are in the open position.

[Rules 13.010-13.020, filed 9/28/64.]

**WAC 296-81-140 Hand power elevators and dumbwaiters.** (1) Cars of hand power elevators and dumbwaiters shall be enclosed on all sides not used for entrance. Elevator cars upon which an operator is permitted to ride shall have not more than one compartment.

(2) Hand elevators having a travel of more than fifteen feet shall be provided with a car safety, capable of stopping and sustaining the car and rated load. The car safety device is not required to be operated by a speed governor, and may be of the instantaneous type operated as a result of the breaking or slackening of the suspension members.

(3) Hoistway doors for hand powered elevators shall be so designed that they will insure protection at each landing.

(4) Doors for hand powered dumbwaiters shall be so designed that they will insure protection at all landings.

(5) Every hoistway door, gate, or entrance of hand elevators and hand dumbwaiters shall have conspicuously displayed on the landing side in letters not less than two inches high, the words: DANGER-ELEVATOR-KEEP CLOSED OR DANGER-DUMBWAITER-KEEP CLOSED.

[Rules 14.010-14.050, filed 9/28/64.]

**WAC 296-81-150 Car operating and terminal stopping devices and electrical protective devices.** (1) Handles of lever-type operating devices of car-switch operation elevators shall be so arranged that they will return to the stop position and latch in this position automatically when no pressure is exerted against the handle.

(2) All electric operating devices shall be of the enclosed type. Handrope, wheel, lever, rod or crank type operating devices may be permitted only on freight elevators, provided that electric elevators equipped with these types of operating devices shall be provided with a sequence device.

(3) **Phase reversal and failure protection.** Elevators having polyphase alternating current power supply shall be provided with means to prevent the starting of the elevator motor if:

(a) The phase rotation is in the wrong direction, or

(b) There is a failure of any phase. This does not apply to hydro-electric elevators.

(4) **Main line contactor.** A contactor shall be installed in addition to the direction switches, which will cut off main line current to the motor and apply the brake when any of the final terminal stopping devices operate.

(5) Final terminal stopping devices shall be provided for the following conditions:

(a) Final terminal stopping devices shall be provided and arranged to cause the electric power to be removed automatically from the elevator driving-machine motor and brake after the car has passed a terminal landing but so that under normal operating conditions, it will not function when the car is stopped by the normal terminal

stopping device. Where spring buffers are provided, the device shall function before the buffer is engaged.

(b) Elevators having traction machines shall have final terminal stopping switches located in the hoistway and operated by cams attached to the car.

(c) Elevators having winding-drum machines shall have final terminal stopping switches, located on and operated by the driving machine, which shall not be driven by chain, rope, or belt. Also, stopping switches shall be installed in the hoistway that are operated by cams attached to the car or counterweights.

(6) All elevators having winding-drum machines shall have a slack rope device with an electric switch of the enclosed, manually reset type which will cause the electric power to be removed from the driving machine motor and brake if the hoisting ropes become slack.

(7) The emergency stop switch shall be of the manually opened and closed, or manually opened and automatically closed type operated from within the car and shall be located within or adjacent to the car operating panel. When operated this switch shall cause the electric power to be removed from the driving-machine motor and brake of an electric elevator or from the electrically operated valves and/or pump motor of a hydraulic elevator.

[Rules 15.010-15.070, filed 9/28/64.]

**WAC 296-81-160 Power supply switch.** A fused disconnect switch or a circuit breaker shall be installed and connected into the power supply line to each elevator motor or to the motor of the motor generator set. Disconnect switches or circuit breakers shall be of the manually closed multipole type. Where circuit breakers are used as a disconnecting means, they shall not be of the instantaneous type and shall not be opened automatically by a fire alarm system.

[Rule 16.010, filed 9/28/64.]

**WAC 296-81-170 Access to machine room and machinery space.** A permanent safe means of access shall be provided either by stairway or ladder to elevator and dumbwaiter machine rooms, and overhead machinery space. Ladders shall be constructed in conformity with the safety factors as recognized by the American Standard Association, or by other sound engineering practices. Ladders shall have not less than six and one-half inches from the back of the rungs to the building structure or other objects. There must be at least thirty inches of clear climbing space from the face of the ladder to any fixed object. Carrying of material with hands or arms while ascending or descending the ladder shall be prohibited. Access ladders to the machine room or machinery space shall not be installed within the elevator hatchway. Trap doors that are used as a means of access to the elevator machine room shall be of the counter-balanced type.

[Rule 17.010, filed 9/28/64.]

**WAC 296-81-180 Capacity posting.** Every elevator and dumbwaiter shall be provided with a capacity plate

(1989 Ed.)

or sign permanently and securely fastened in place in the elevator car. Capacity plates or signs shall indicate the rated load of the elevator in pounds. On freight elevator cars the plate or sign shall also specify "FOR FREIGHT ONLY."

[Rule 18.010, filed 9/28/64.]

**WAC 296-81-190 Illumination.** All elevator cars shall be provided with an electric light or lights. Where the car lights are controlled by a switch in the car, the control switch shall be located in or adjacent to the car operating device. It is recommended that light switches, if installed in cars of automatic operation elevators, be of the key operated type.

[Rule 19.010, filed 9/28/64.]

**WAC 296-81-200 Adoption of elevator codes.** (1) Public hearings were held July 23, 1963 and September 24, 1963 at Olympia, Washington, in accordance with section 25, chapter 130, Laws of 1919, as amended by RCW 49.16.090, chapter 34.04 RCW to consider safety rules governing construction, alterations, use and maintenance of elevators, belt manlifts and moving walks.

(2) American Standard Safety Code for elevators, dumbwaiters and escalators A17.1 1960 shall apply to all new installations.

(3) American Standard Safety Code rules for moving walks A.S.A. 17.1.13 1962. This shall apply to all installations.

(4) Part X of A.S.A. A17.1 1960 maintenance shall apply to existing installations. This part gives maintenance instructions in regard to lubrication, cleanliness, painting, and refinishing, reshackeling and tagging of hoisting ropes, and the inspection and testing of pressure tanks and piston rods.

(5) These requirements became effective as of November 1, 1963.

National Elevator Code adopted—1967: WAC 296-81-006.

[Section 20 of rules, filed 9/28/64.]

**WAC 296-81-220 Illumination of pits.** A permanent lighting fixture shall be provided in all pits which shall provide an illumination of not less than five foot candles at the pit floor. A light switch shall be provided and shall be so located as to be accessible from the pit access door.

[Order 73-1, § 296-81-220, filed 4/16/73.]

**WAC 296-81-240 Valves.** A shut-off valve shall be installed in the pit on all hydraulic elevators. (For new installations.)

[Order 73-1, § 296-81-240, filed 4/16/73.]

**WAC 296-81-260 Photo electric or electric eye devices.** An elevator equipped with a photo electric or electric eye device for reopening of the car and hoistway doors shall be provided with a means that will automatically bypass the light ray if obstruction of the light ray for approximately 20 seconds has prevented the doors

[Title 296 WAC—p 1737]

from closing. The light ray shall not be reestablished until the doors have fully closed. Upon a sufficient showing of need by a hospital or a nursing home, the department may authorize an automatic bypass means that will cause the doors to close within 35 seconds after the expiration of the normal door open time. Exceptions: When smoke detectors are used to bypass photo electric or electric eye devices. In accordance with ANSI A17.1-211.3A.

[Statutory Authority: RCW 70.87.080, 70.87.090 and 70.87.100. 86-03-024 (Order 86-1), § 296-81-260, filed 1/10/86. Statutory Authority: RCW 70.87.030. 82-12-005 (Order 82-18), § 296-81-260, filed 5/20/82; Order 76-37, § 296-81-260, filed 12/3/76; Order 73-1, § 296-81-260, filed 4/16/73.]

**WAC 296-81-270 Counterweight pit guards.** (1) Where practicable. Unperforated metal guards shall be installed in the pit on the open side or sides on all counterweights where spring or solid-type buffers are used or where oil buffers attached to the counterweight are used.

EXCEPTION: Where compensating chains or ropes are attached to the counterweight the guard may be omitted on the side facing the elevator car to which the chains or ropes are attached.

(2) Design, construction and location of guards. Guards shall extend from a point not more than twelve inches above the pit floor to a point not less than seven feet nor more than eight feet above such floor, and shall be fastened to a metal frame properly reinforced and braced to be at least equal in strength and stiffness to No. 14 U.S. gauge sheet steel.

[Order 73-1, § 296-81-270, filed 4/16/73.]

**WAC 296-81-275 Smoke detectors.** Phase I recall shall be provided for all elevators with fully automatic open and close power operated doors, and shall be activated from, but not limited to, alarm devices in the elevator equipment room(s) and lobbies or areas adjacent to hoistways. Devices for deactivating recall shall be secure from tampering and shall be accessible to fire, inspection, and elevator service personnel only. Owner-designated patient express and emergency hospital service elevators may have a manual control in the car for use by authorized patient care personnel. When activated, it shall preclude Phase I recall.

[Statutory Authority: RCW 70.87.080, 70.87.090 and 70.87.100. 88-19-053 (Order 88-18), § 296-81-275, filed 9/15/88.]

**WAC 296-81-277 Method to achieve ANSI A17.1-102.2 (c)4.** ANSI A17.1-102.2 (c)4 regarding automatic sprinklers in hoistways and machine rooms states:

"Means shall be provided to automatically disconnect the mainline power supply to the affected elevator prior to the application of water."

Rule 102.2 (c)4 shall be accomplished in the following manner:

(1) Fixed temperature heat detector(s) (one hundred thirty-five degrees Fahrenheit) shall be provided at the top of the elevator hoistway and within the elevator equipment room to disconnect the mainline power of the

elevator prior to the application of water from the sprinkler.

(2) Heat detectors shall be ceiling mounted and located within eighteen inches of each sprinkler head. Heat detectors shall be an auxiliary function of the elevator equipment only and shall be identified "elevator control only - DO NOT TEST."

(3) Power for the automatic disconnect control circuit shall be derived from the load side of the elevator power main disconnecting means. The disconnect control device shall be located in the elevator equipment room and shall be easily identifiable.

(4) Automatic sprinkler heads installed in elevator pits do not require a power disconnect device but shall be installed in such a way that the water spray pattern shall not spray higher than three feet above the pit floor with a spray pattern directed level and down. A shut-off valve shall be provided.

Alternate methods to achieve ANSI A17.1-102.2 (c)4 must receive approval from the Washington state department of labor and industries elevator section prior to installation.

[Statutory Authority: RCW 70.87.080, 70.87.090 and 70.87.100. 88-24-022 (Order 88-27), § 296-81-277, filed 12/2/88.]

**WAC 296-81-300 Operation and leveling.** The elevator shall be automatic and be provided with a self-leveling feature that will automatically bring the car to the floor landings within a tolerance of plus or minus 1/2 inch under normal loading and unloading conditions. This self-leveling shall within its zone, be entirely automatic and independent of the operating device and shall correct for overtravel or undertravel. The car shall also be maintained approximately level with the landing irrespective of load.

[Statutory Authority: RCW 70.87.030. 81-01-034 (Order 80-26), § 296-81-300, filed 12/10/80.]

**WAC 296-81-305 Door operation.** Power operated car and hoistway doors opened and closed by automatic means shall be provided.

DOOR SIZE. Minimum clear width for elevator doors shall be 32 inches.

DOOR PROTECTIVE AND REOPENING DEVICE. Doors closed by automatic means shall be provided with a door reopening device which will function to stop and reopen a car door and adjacent hoistway door in case the car door is obstructed while closing. This reopening device shall also be capable of sensing an object or person in the path of a closing door without requiring contact for activation at a nominal 5 and 20 inches above the floor.

[Statutory Authority: RCW 70.87.030. 81-01-034 (Order 80-26), § 296-81-305, filed 12/10/80.]

**WAC 296-81-310 Door delay.** (1) HALL CALL. The minimum acceptable initial transfer time from notification that a car is answering a call (lantern and audible signal) until the doors of the car start to close shall be 0 to 5 ft. - 4 sec., 10 ft. - 7 sec., 15 ft., - 10 sec., 20 ft. - 13 sec. The distance shall be established from a point in the center of the corridor or lobby (maximum 5 feet)

directly opposite the farthest hall button controlling that car to the centerline of the hoistway entrance.

(2) **CAR CALL.** The minimum acceptable initial transfer time for doors to remain fully open shall be not less than 3 seconds.

[Statutory Authority: RCW 70.87.030. 81-01-034 (Order 80-26), § 296-81-310, filed 12/10/80.]

**WAC 296-81-315 Car interior.** The car interior shall allow for the turning of a wheelchair. The minimum clear distance between walls or between wall and door, excluding return panels, shall be not less than 68 x 54 inches. Minimum distance from wall to return panel shall be not less than 51 inches.

**EXCEPTION.** Elevators provided in existing schools, institutions, or other buildings specifically authorized by local authorities may have a minimum clear distance between walls or between wall and door including return panels of not less than 54 x 54 inches. Minimum distance from wall to return panel shall be not less than 51 inches.

[Statutory Authority: RCW 70.87.030. 81-01-034 (Order 80-26), § 296-81-315, filed 12/10/80.]

**WAC 296-81-320 Car controls.** At least one set of controls shall be readily accessible from a wheelchair upon entering an elevator.

The centerline of the alarm button and emergency stop switch shall be at nominal (35) inches and the highest floor buttons no higher than (54) inches from the floor. Floor registration buttons, exclusive of border, shall be a minimum of (3/4) inch in size, raised or flush. Visual indication shall be provided to show each call registered and extinguished when call is answered. Depth of flush buttons when operated shall not exceed (3/8) inch.

Markings shall be adjacent to the controls on a contrasting color background to the left of the controls. Letters or numbers shall be a minimum of (5/8) inch high and raised (.030) inch. Applied plates permanently attached shall be acceptable. Emergency controls shall be grouped together at the bottom of the control panel. Symbols as indicated shall be used to assist in readily identifying essential controls (see ANSI A17.1, page 114, Rule 211.1). Controls not essential to the operation of the elevator may be located as convenient.

[Statutory Authority: RCW 70.87.030. 81-01-034 (Order 80-26), § 296-81-320, filed 12/10/80.]

**WAC 296-81-325 Car position indicator signal.** A car position indicator shall be provided above the car operating panel or over the opening of each car to show the position of the car in the hoistway by illumination of the indication corresponding to the landing at which the car is stopped or passing.

Indications shall be on a contrasting color background and a minimum of (1/2) inch in height.

[Statutory Authority: RCW 70.87.030. 81-01-034 (Order 80-26), § 296-81-325, filed 12/10/80.]

(1989 Ed.)

**WAC 296-81-330 Telephone or intercommunicating system.** A means to two-way communication shall be provided between the elevator and a point outside the hoistway in accordance with the requirements found in the latest edition of ANSI A17.1. If a telephone is provided, the highest part shall be located a maximum of (54) inches from the floor with a minimum cord length of (36) inches.

Markings or the international symbol for telephones shall be on or adjacent to the control on a contrasting color background. Letters or numbers shall be a minimum of (5/8) inch high and raised (.030) inch. Applied plates permanently attached shall be acceptable.

[Statutory Authority: RCW 70.87.030. 81-01-034 (Order 80-26), § 296-81-330, filed 12/10/80.]

**WAC 296-81-335 Floor covering.** Floor covering should have a nonslip hard surface which permits easy movement of wheelchairs. If carpeting is used, it should be securely attached, heavy duty, with a tight weave and low pile, installed without padding.

[Statutory Authority: RCW 70.87.030. 81-01-034 (Order 80-26), § 296-81-335, filed 12/10/80.]

**WAC 296-81-340 Handrails.** A handrail shall be provided on all walls of the car that are not used for normal exits. There shall be a space of one and one-half inches between the wall and the rail. The rail shall be at a nominal height of thirty-five inches from the floor. The hand grip portion of handrails shall be not less than one and one-quarter inches or more than two inches in width, shall be basically oval or round in cross-section, and shall have smooth surfaces with no sharp corners. Handrails that approach each other or a blank car wall in the interior corners of the car need not be returned to the wall. If the end of the handrail presents an abrupt end on the closing jamb wall to persons entering a car that has a single-slide or two-speed entrance, the handrail end shall be returned to the wall.

[Statutory Authority: RCW 70.87.185 and 70.87.034. 84-05-005 (Order 83-37), § 296-81-340, filed 2/6/84. Statutory Authority: RCW 70.87.030. 81-01-034 (Order 80-26), § 296-81-340, filed 12/10/80.]

**WAC 296-81-345 Minimum illumination.** The minimum illumination shall be in accordance with the latest edition of ANSI A17.1.

[Statutory Authority: RCW 70.87.030. 81-01-034 (Order 80-26), § 296-81-345, filed 12/10/80.]

**WAC 296-81-350 Door jam marking.** The floor designation shall be provided at each hoistway entrance on both sides of jamb visible from within the car and the elevator lobby at a centerline height of (60) inches above the floor. Designations shall be on contrasting color background (2) inches high and raised (.30) inch. Applied plates permanently attached shall be acceptable.

[Statutory Authority: RCW 70.87.030. 81-01-034 (Order 80-26), § 296-81-350, filed 12/10/80.]

**WAC 296-81-355 Hall buttons.** The centerline of the hall call buttons shall be a nominal (42) inches

[Title 296 WAC—p 1739]



above the floor. The button designating the UP direction shall be on top.

Direction buttons, exclusive of border, shall be a minimum of (3/4) inch in size, raised, or flush. Visual indication shall be provided to show each call registered and extinguished when the call is answered. Depth of flush buttons when operated shall not exceed (3/8) inch.

[Statutory Authority: RCW 70.87.030. 81-01-034 (Order 80-26), § 296-81-355, filed 12/10/80.]

**WAC 296-81-360 Hall lantern.** A visual and audible signal shall be provided at each hoistway entrance, indicating to the prospective passenger which car is answering the call and its direction of travel.

The visual signal for each direction shall be at least two and one-half inches in size and visible from the vicinity of the hall call button. The audible signal shall sound once for the up direction and twice for the down direction.

The centerline of the fixture shall be located at least six feet from the floor.

The lanterns may be located in the jamb or in the car.

[Statutory Authority: RCW 70.87.185 and 70.87.034. 84-05-005 (Order 83-37), § 296-81-360, filed 2/6/84. Statutory Authority: RCW 70.87.030. 81-01-034 (Order 80-26), § 296-81-360, filed 12/10/80.]

**WAC 296-81-365 Emergency use.** Elevators shall comply with ANSI Standard A17.1, Rule 211.3a.

[Statutory Authority: RCW 70.87.030. 81-01-034 (Order 80-26), § 296-81-365, filed 12/10/80.]

**WAC 296-81-370 Effective date.** The preceding WAC rules, 296-81-300 through 296-81-365, shall apply to all new installations made after the adoption of these rules.

[Statutory Authority: RCW 70.87.030. 81-01-034 (Order 80-26), § 296-81-370, filed 12/10/80.]

**WAC 296-81-990 Advisory board.** (1) There is created an advisory board on conveyances. The board shall be composed of five persons appointed by the director of labor and industries or his or her designee with the advice of the chief of the elevator section. The first board members shall serve the following terms:

- (a) One member shall serve for one year;
- (b) One member shall serve for two years;
- (c) One member shall serve for three years; and
- (d) Two members shall serve for four years.

After the first terms, all members shall serve for four years.

(2) The board shall meet on the third Tuesday of February, May, August, and November of each year, and at other times at the discretion of the chief of the elevator section. The board members shall serve without per diem or travel expenses.

(3) The purposes of the board are to advise the department on adoption of codes and rules that apply to conveyances; methods for enforcing and administering the elevator law, chapter 70.87 RCW; and matters of concern to the industry and to owners and users of conveyances.

(4) The chief of the elevator section shall act as secretary for the board.

[Statutory Authority: RCW 70.87.030. 82-12-005 (Order 82-18), § 296-81-990, filed 5/20/82.]

**WAC 296-81-991 Civil penalties.** (1) An owner or operator of a conveyance that violates a provision of chapter 70.87 RCW, or of the rules adopted under that chapter, is liable for a civil penalty based on the following schedule.

- (a) Operation of a conveyance without a permit:
  - First violation ..... \$150.00
  - Second violation ..... \$300.00
  - Each additional violation ..... \$500.00
- (b) Installation of a conveyance without a permit:
  - First violation ..... \$150.00
  - Second violation ..... \$300.00
  - Each additional violation ..... \$500.00
- (c) Relocation of a conveyance without a permit:
  - First violation ..... \$150.00
  - Second violation ..... \$300.00
  - Each additional violation ..... \$500.00
- (d) Alteration of a conveyance without a permit:
  - First violation ..... \$150.00
  - Second violation ..... \$300.00
  - Each additional violation ..... \$500.00
- (e) Operation of a conveyance for which the department has issued a red tag or has revoked or suspended an operating permit: ..... \$500.00
- (f) Failure to comply with a correction notice:
  - Within 90 days ..... \$100.00
  - Within 91-180 days ..... \$250.00
  - Within 181-270 days ..... \$400.00
  - Within 271-360 days ..... \$500.00

(2) A violation will be a "second" or "additional" violation only if it occurs within one year of the first violation.

(3) The department shall by certified mail notify a person of its determination that the person has violated this section.

(4) A person aggrieved by a notice of the department under this section may request a hearing to contest the department's determination that a violation has occurred or to contest the penalty. The request for hearing must be in writing, and must be accompanied by a certified or cashier's check for two hundred dollars payable to the department. The request for hearing must be post-marked, or must be received by the department, within fifteen days after the person receives the order of the department.

[Statutory Authority: RCW 70.87.030 and 70.87.185. 84-23-001 (Order 84-21), § 296-81-991, filed 11/8/84. Statutory Authority: RCW 70.87.185 and 70.87.034. 84-05-005 (Order 83-37), § 296-81-991, filed 2/6/84.]



**Chapter 296-82 WAC**  
**SAFETY STANDARDS FOR EXISTING BELT**  
**MANLIFTS**

**WAC**

296-82-010	Belt manlifts—Definitions.
296-82-016	General requirements—Landings.
296-82-019	General requirements—Floor opening guards.
296-82-022	General requirements—Protection of entrances and exits.
296-82-025	General requirements—Guards for openings.
296-82-028	General requirements—Guards at floor landings.
296-82-031	General requirements—Bottom arrangement.
296-82-034	General requirements—Top clearance.
296-82-037	General requirements—Emergency exit ladders.
296-82-040	General requirements—Illumination.
296-82-045	Belt manlifts mechanical requirements—Machines.
296-82-048	Belt manlifts mechanical requirements—Speed.
296-82-051	Belt manlifts mechanical requirements—Platforms or steps.
296-82-054	Belt manlifts mechanical requirements—Handholds.
296-82-057	Belt manlifts mechanical requirements—Up limit stops.
296-82-060	Belt manlifts mechanical requirements—Emergency stop.
296-82-066	Belt manlifts mechanical requirements—Instruction and warning signs.
296-82-070	Operating rules—Carrying of materials and tools.
296-82-078	Tests and inspections—Periodic inspection.

**DISPOSITION OF SECTIONS FORMERLY CODIFIED IN THIS CHAPTER**

296-82-013	General requirements—Floor openings. [Rule 1.010, effective 12/1/62.] Repealed by Order 74-31, filed 6/14/74.
296-82-063	Belt manlifts mechanical requirements—Factors of safety. [Rule 2.070, effective 12/1/62.] Repealed by Order 74-31, filed 6/14/74.
296-82-075	Tests and inspection—Acceptance tests. [Rule 4.010, effective 12/1/62.] Repealed by Order 74-31, filed 6/14/74.

**WAC 296-82-010 Belt manlifts—Definitions.** (1) **Factor safety.** The factor of safety is the ratio of the ultimate strength of the material to the allowable stress when a part is subjected to full load operation.

(2) **Handhold (handgrip).** A handhold is a device attached to the belt to assist a passenger in maintaining balance.

(3) **Open type.** One which has a handgrip surface fully exposed.

(4) **Closed type.** A cup-shaped device in which the handgrip surface is available only in the direction of travel and is covered on the opposite run.

(5) **Limit switch.** A device the purpose of which is to cut off the power to the motor and apply the brake to stop the carrier in the event that a loaded step passes the top terminal landing.

(6) **Manlift.** A manlift is a device consisting of a power-driven endless belt provided with steps or platforms and handholds attached to it for the transportation of personnel from floor to floor.

(7) **Rated speed.** Rated speed is the speed for which the device is designed and installed.

(8) **Step (platform).** A step is a passenger carrying unit.

[Rules (part), effective 12/1/62.]

(1989 Ed.)

**WAC 296-82-016 General requirements—Landings.**

(1) **Vertical clearance.** The clearance between the floor or mounting platform and the lower edge of the conical guard above it required by WAC 296-82-019 shall be not less than seven feet, six inches. Where this clearance cannot be obtained no access to the manlift shall be provided and the manlift runway shall be enclosed where it passes through such floor.

(2) **Clear landing space.** The floor space adjacent to the floor openings shall be free from obstructions and kept clear at all times.

(3) **Lighting of landings.** Adequate lighting, not less than three foot-candles, shall be provided at each floor landing at all times when the lift is in operation.

(4) **Landing surface.** The landing surfaces at the entrances and exits to the manlift shall be so constructed and maintained as to provide safe footing at all times.

(Coefficient of friction of not less than 0.5.)

**(5) Emergency landings.**

(a) Emergency landings shall be provided so that anyone who is required to transfer from the belt manlift to the emergency ladder will not be required to travel on an emergency ladder a distance greater than twenty-five feet to a floor landing or an emergency landing.

(b) Such emergency landings shall be accessible from both runs of the manlift and shall give access to the ladder required in WAC 296-82-037.

(c) Emergency platforms shall be completely enclosed with a standard railing and toeboard.

[Rule 1.020, effective 12/1/62.]

**WAC 296-82-019 General requirements—Floor opening guards.** (1) On the ascending side of the manlift all landings shall be provided with a bevel guard or cone meeting the following requirements:

(a) **Slope.** Where possible, the cone shall make an angle of not less than forty-five degrees with the horizontal. An angle of sixty degrees or greater shall be used where ceiling heights permit.

(b) **Extent.** Where possible, the guard shall extend at least forty-two inches outward from any handhold on the belt. It shall not extend beyond the upper surface of the floor above.

(c) **Material and construction.** The cone shall be made of not less than Number 18 U.S. gauge sheet steel or material of equivalent strength or stiffness. The lower edge shall be rolled to a minimum diameter of one-half inch and the interior shall be smooth with no rivets, bolts or screws protruding.

(2) Obstructions shall be guarded in the same manner as floor openings with the same minimum distances observed.

[Order 74-31, § 296-82-019, filed 6/14/74; Rule 1.030, effective 12/1/62.]

**WAC 296-82-022 General requirements—Protection of entrances and exits.** (1) **Guardrail requirement.** The entrances and exits at all floors or landings affording access to the manlift shall be guarded by a maze (staggered railing) or a handrail equipped with self closing gates.

[Title 296 WAC—p 1741]

(2) **Construction.** The rails shall be standard guard-rails with toeboards meeting the requirements of the general safety standards.

(3) **Gates.** Gates, if used, shall open outward and shall be self closing. Corners of gates shall be rounded.

(4) **Maze.** Maze or staggered openings shall offer no direct passage between enclosure and outer floor space.

(5) Rails shall be located at least two feet but not more than four feet from the edge of the opening measured at right angles to the face of the belt. The intersection of the top rail and the end post at openings shall be a bend or standard long sweep "ell."

(6) Except where building layout prevents, entrances at all landings shall be in the same relative position.

[Rule 1.040, effective 12/1/62.]

**WAC 296-82-025 General requirements--Guards for openings.** (1) **Construction.** The floor opening at each landing shall be guarded on sides not used for entrances or exit by a standard railing and toeboard or by panels of wire mesh of not less than number 10 U.S. gauge, expanded metal of not less than number 13 U.S. gauge or sheet metal of equivalent strength or metal on a frame of angle iron not less than one and one-quarter by one-eighth inch or of one and one-quarter inch iron pipe.

(2) When belt manlift is installed in a stair well a standard guard rail shall be placed between the floor openings of the manlift and the stairways.

(3) **Height and location.** Such rails or guards shall be at least forty two inches in height on the up-running side and sixty six inches on the down running side. If a guardrail is used the section of the guard above the rail may be of the construction specified in subsection (1) above or may consist of vertical or horizontal bars which will reject a ball six inches in diameter. Rails or guards shall be located not more than one foot from the edge of the floor opening.

[Rule 1.050, effective 12/1/62.]

**WAC 296-82-028 General requirements--Guards at floor landings.** Expanded metal, sheet metal or wood guards must be installed to cover the area from the floor to seven feet above the floor on each exposed side of the belt manlift at each floor landing, so persons can not place their hands in the area where the step rollers travel.

[Rule 1.060, effective 12/1/62.]

**WAC 296-82-031 General requirements--Bottom arrangement.** (1) **Bottom landing.** (Where possible.) At the bottom landing the clear area shall be not smaller than the area enclosed by the guardrails on the floors above, and any wall in front of the "down" running side of the belt shall be not less than forty-eight inches from the face of the belt. This space shall not be encroached upon by stairs or ladders.

(2) **Location of lower pulley.** The lower (boot) pulley shall be installed so that it is supported by the lowest landing served.

[Title 296 WAC—p 1742]

(3) **Mounting platform.**

(a) A mounting platform shall be provided in front or to one side of the up-run at the lowest landing, unless the floor level is such that the following requirement can be met: The floor or platform shall be at or above the point at which the upper surface of the ascending step assumes a horizontal position.

(b) A platform shall be provided in front or to one side of the down-run at the lowest landing unless the floor level is such that the following requirements can be met: The floor or platform shall be at or above the point at which the upper surface of the descending step leaves the horizontal position.

[Order 74-31, § 296-82-031, filed 6/14/74; Rule 1.070, effective 12/1/62.]

**WAC 296-82-034 General requirements--Top clearance.** Top emergency landing. (Where possible.) Where the center of the head pulley is greater than six feet above the top landing, an emergency landing and ladder must be installed. The landing shall be twenty-four inches below the center of the head pulley.

[Order 74-31, § 296-82-034, filed 6/14/74; Rule 1.080, effective 12/1/62.]

**WAC 296-82-037 General requirements--Emergency exit ladders.** (1) **Where required.** A fixed metal ladder accessible from both the "up" and "down" run of the manlift shall be provided where the vertical distance between landings exceeds twenty feet.

(2) **Construction.** Such ladder shall be in accordance with the existing general safety standards for ladders except that enclosing cages shall not be provided.

[Rule 1.090, effective 12/1/62.]

**WAC 296-82-040 General requirements--Illumination.** (1) **General.** Both runs of the manlift shall be illuminated at all times when the lift is in operation. An intensity of not less than one foot-candle shall be maintained at all points.

(2) **Control of illumination.** Lighting of manlift runways shall be by means of circuits permanently tied in to the building circuits (no switches), or shall be arranged to be turned on by the starting switch controlling the manlift motor, or shall be controlled by switches at each landing. Where separate switches are provided at each landing, any switch shall turn on all lights necessary to illuminate the entire runway.

[Rule 1.100, effective 12/1/62.]

**WAC 296-82-045 Belt manlifts mechanical requirements--Machines.** (1) **Types.** Machines shall be of the direct connected type or shall be driven by multiple V-belts. Cast-iron gears shall not be used.

(2) **Brake.** A mechanically applied, electrically released brake shall be applied to the motor shaft for direct connected units or to the in-put shaft for belt driven units. The brake shall be capable of stopping and holding the manlift with its rated capacity.

(3) **Belt fastenings.** Belts shall be fastened by a lapped splice or shall be butt spliced with a strap on the side of

the belt away from the pulley. For lapped splices, the overlap of the belt at the splice shall be not less than three feet where the total travel of the manlift does not exceed one hundred feet and not less than four feet, if the travel exceeds one hundred feet.

Where butt splices are used the straps shall extend not less than three feet on one side of the butt for a travel not in excess of one hundred feet, and four feet for a travel in excess of one hundred feet.

For twelve inch belts, the joint shall be fastened with not less than twenty special elevator bolts, each of a minimum diameter of one-quarter inch. These bolts shall be arranged symmetrically in five rows so arranged as to cover the area of the joint effectively. The minimum number of bolts for a belt width of fourteen inches shall be not less than twenty-three and for belt widths of sixteen inches, the number of bolts shall be not less than twenty-seven.

(4) **Overspeed protection.** The machine shall be so designed and constructed to hold the driving pulley in event of shaft failure or overspeed. This applies to new and existing installations.

[Order 74-31, § 296-82-045, filed 6/14/74; Rule 2.010, effective 12/1/62.]

**WAC 296-82-048 Belt manlifts mechanical requirements--Speed.** All manlifts in a given plant should run at approximately the same speed.

[Order 74-31, § 296-82-048, filed 6/14/74; Rule 2.020, effective 12/1/62.]

**WAC 296-82-051 Belt manlifts mechanical requirements--Platforms or steps.** (1) **Minimum depth.** Steps or platforms shall be not less than twelve inches nor more than fourteen inches deep, measured from the belt to the edge of the step or platform.

(2) **Width.** The width of the step or platform shall be not less than the width of the belt to which it is attached.

(3) **Distance between steps.** The distance between steps shall be equally spaced and not less than sixteen feet measured from the upper surface of one step to the upper surface of the next step above it.

(4) **Angle of step.** The surface of the step shall make approximately a right angle with the "up" and "down" run of the belt, and shall travel in an approximately horizontal position with the "up" and "down" run of the belt.

(5) **Surfaces.** The upper or working surfaces of the step shall be of a material having inherent nonslip characteristics (coefficient of friction not less than 0.5) or shall be covered completely by a nonslip tread securely fastened to it.

(6) **Strength of step supports.** Step frames or supports and their guides shall be adequate strength to:

- (a) Prevent the disengagement of any step roller.
- (b) Prevent any appreciable misalignment.
- (c) Prevent any visible deformation of the step or its support.

(1989 Ed.)

(7) **Prohibition of steps without handholds.** No step shall be provided unless there is a corresponding handhold above or below it meeting the requirements of WAC 296-82-054. If a step is removed for repairs or permanently, the handholds immediately above and below it shall be removed before the lift is again placed in service.

[Order 74-31, § 296-82-051, filed 6/14/74; Rule 2.030, effective 12/1/62.]

**WAC 296-82-054 Belt manlifts mechanical requirements--Handholds.** (1) **Location.** Handholds attached to the belt shall be provided and so installed that they are not less than four feet nor more than four feet eight inches above the step tread. These shall be so located as to be available on both the "up" and "down" run of the belt.

(2) **Size.** The grab surface of the handhold shall be not less than four and one-half inches in width. Fastenings for handholds shall not come within one inch of the belt edge.

(3) **Strength.** The handhold shall be capable of withstanding without damage a load of three hundred pounds applied parallel to the run of the belt.

(4) **Prohibition of handhold without steps.** No handhold shall be provided without a corresponding step. If a handhold is removed permanently or temporarily, the corresponding step and handhold for the opposite direction of travel shall also be removed before the lift is again placed in service.

[Order 74-31, § 296-82-054, filed 6/14/74; Rule 2.040, effective 12/1/62.]

**WAC 296-82-057 Belt manlifts mechanical requirements--Up limit stops.** (1) **Requirements.** Two separate automatic stop devices shall be provided to cut off the power and apply the brake when a loaded step passes the upper terminal landing. One of these shall consist of a switch mechanically operated by the belt or step roller. The second may consist of any of the following:

(a) Roller switch placed above and out of line with the first limit switch.

(b) Photocell and light source ("electric eye").

(c) A switch actuated by a lever, rod, or plate, the latter placed above the head pulley so as to just clear a passing step.

(2) **Manual reset location.** After the manlift has been stopped by this device it shall be necessary to reset the automatic stop manually. The device shall be so located at the top landing that a person resetting it shall have a clear view of both the "up" and "down" runs of the manlift. It shall not be possible to reset the device from any step or platform.

(3) **Cut-off point.** The device shall function so that the manlift will be stopped before the loaded step has reached a point twenty-four inches above the top terminal landing.

(4) **Electrical requirements.**

(a) Where such switches open the main motor circuit directly they shall be of the multiple type.

[Title 296 WAC--p 1743]

(b) Where photoelectric devices are used they shall be so designed and installed that the failure of the light source, or of the light sensitive element, or of any other vacuum tubes employed in the circuit will result in shutting off the power to the driving motor.

(c) Where flammable vapors or dusts may be present all electrical installations shall be in accordance with national electrical code requirements for such locations.

(d) Unless of the oil immersed type, controller contacts carrying the main motor current shall be copper to carbon, except where the circuit is broken at two or more points simultaneously.

[Rule 2.050, effective 12/1/62.]

**WAC 296-82-060 Belt manlifts mechanical requirements--Emergency stop.** (1) Requirement. An emergency stop means shall be provided.

(2) Location. This stop means shall be within easy reach of the ascending and descending runs of the belt.

(3) Operation. This stop means shall be so connected with the control lever or operating mechanism that it will cut off the power and apply the brake when pulled in the direction of travel.

(4) Material. This stop may consist of a cotton rope with a wire center, manila or sisal rope, or may be made up of suitable lengths of metallic pipe or tubing. If rope is used, it shall be not less than three-eighths inch in diameter. Wire rope, unless marlin covered, shall not be used.

(5) Normal stopping use. This emergency stop may be used for normal stopping (and starting) where the manlift does not run continuously.

(6) Emergency stop switch, treadle type on down side. An emergency stop treadle switch shall be placed in the area below the lowest landing on the "down" side. This switch must stop the mechanism if a person should fail to get off at the lowest landing and be ejected from the step as it approaches its position to travel around the boot pulley. The treadle stop switch shall be of the manual reset type.

[Order 74-31, § 296-82-060, filed 6/14/74; Rule 2.060, effective 12/1/62.]

**WAC 296-82-066 Belt manlifts mechanical requirements--Instruction and warning signs.** (1) Instruction signs at landings or on belt. Signs of conspicuous and easily read style giving instructions for the use of the manlift shall be posted at each landing or stenciled on the belt.

(a) Size and legibility. Such signs shall be of letters not less than one inch in height and of a color having high contrast with the surface on which it is stenciled or painted (white or yellow on black or black on white or gray).

(b) Inscription. The instructions shall read approximately as follows:

"Face the belt"  
"Use the handhold"  
"To stop - pull rope"

(2) Top floor warning sign or light.

(a) Requirement. At the top floor an illuminated sign be displayed bearing the following wording:

"Top floor - get off"

(b) Size of letters. Signs shall be in block letters not less than two inches in height

(c) Location. This sign shall be located within easy view of an ascending passenger and not more than two feet above the top terminal landing.

(d) Alternate warning light. As an alternate for the sign required by (2)(a) above, a red light of not less than forty watt rating may be provided immediately below the upper terminal landing and so located as to shine in a passenger's face will be accepted.

(3) Visitor warning.

(a) Requirement. A conspicuous sign having the following legend - "employees only - visitors keep off" - shall be displayed at each landing.

(b) Size of letters. Sign shall be of block letters not less than two inches in height and shall be of a color offering high contrast with the background color.

(4) Bottom of manlift warning sign or light.

(a) A sign or light warning the passenger he is approaching bottom landing shall be posted above bottom landing in a conspicuous place. Sign or light to be similar in size to top warning light and sign noted above.

(b) An electric buzzer. An electric buzzer shall be installed five feet above the bottom landing on the down side to warn the rider that he is approaching the bottom landing and the buzzer shall be activated automatically by the weight of a load on a step.

[Rule 2.080, effective 12/1/62.]

**WAC 296-82-070 Operating rules--Carrying of materials and tools.** (1) No freight or packaged goods shall be carried on any manlift.

(2) No pipe, lumber, or other construction materials shall be handled on any manlift.

(3) No tools except those which will fit entirely within a pocket in usual working clothes shall be carried on any manlift except as provided in subsection (4) below.

(4) Tools may be carried in a canvas bag having dimensions not larger than eleven inches by thirteen inches and provided with carrying loops or handles. Such bag shall be provided with a leather bottom. Such bag shall not be provided with shoulder straps but shall be carried in the passenger's hand while he is riding the manlift.

[Rule 3.010, effective 12/1/62.]

**WAC 296-82-078 Tests and inspections--Periodic inspection.** (1) Frequency. All manlifts shall be inspected by a competent designated person at intervals of not more than thirty days.

(2) Items covered. This periodic inspection shall cover but is not limited to the following items:

Steps  
Step fastenings  
Rails  
Rail supports and fastenings  
Rollers and slides

Belt and belt tension  
 Handholds and fastenings  
 Guardrails  
 Lubrication  
 Warning signs and lights  
 Signal equipment  
 Drive pulley  
 Bottom (boot) and pulley  
 Clearance  
 Pulley supports  
 Motor  
 Driving mechanism  
 Brake  
 Electrical switches

(3) **Inspection log.** A written record shall be kept of findings at each inspection. Records of inspection shall be made available to duly qualified inspectors.

[Rule 4.020, effective 12/1/62.]

### Chapter 296-84 WAC HAND POWER MANLIFTS

#### WAC

296-84-010	Scope and application.
296-84-015	Waiver and variance.
296-84-020	Hoistway landings.
296-84-025	Hoistway clearances.
296-84-030	Habitable space under hoistways.
296-84-035	Hoistway guide rails.
296-84-040	Buffer springs and overtravel of car.
296-84-045	Car specifications.
296-84-050	Counterweights.
296-84-055	Sheaves.
296-84-060	Hoisting ropes.
296-84-065	Operating rope.
296-84-070	Lighting.
296-84-075	Overhead supports.
296-84-080	General requirements.

**WAC 296-84-010 Scope and application.** The following requirements shall apply to the installation, design and use of all one man capacity, hand power counterweighted elevators subject to inspection as required by RCW 49.16.120.

[Rules (part), effective 5/15/64.]

**WAC 296-84-015 Waiver and variance.** The supervisor of safety may, upon receipt of application and after adequate investigation by the department, permit a variation from these requirements when other accepted means of protection are provided. Any variation granted under the provisions of this paragraph shall be limited to the particular case or cases covered in the application for variation and may be revoked for cause. The permit for variance shall be conspicuously posted on the premises prior to becoming effective and shall remain posted during the life of such waiver.

[Rules (part), effective 5/15/64.]

**WAC 296-84-020 Hoistway landings.** (1) Every hoistway landing shall be protected on sides other than the landing opening side with a standard guard rail and

intermediate guard rail. All landings except the bottom landing shall have a toe board installed on all sides except the landing opening side.

(2) All hoistway entrances shall be not less than six feet six inches in height and in no case shall the width exceed the corresponding car dimensions.

(3) All hoistway entrances must be provided with an approved maze or with a hoistway gate which shall:

(a) Be at least thirty-six inches in height.

(b) Extend downward to within one inch of the landing sill.

(c) Be of the self-closing type, designed to swing horizontally out from the hoistway and closing against a full jam stop.

(d) Be located within four inches of the hoistway edge of the landing sill.

(e) Have a "DANGER" sign conspicuously posted on the landing side of the hoistway gate.

(f) Withstand a two hundred fifty pound horizontal thrust.

(4) For any new installation, all projections extending inwardly from the hoistway enclosure at the entrance side of the car platform shall be bevelled and substantially guarded on the underside by smooth solid material set at an angle of not less than sixty degrees, nor more than seventy-five degrees from the horizontal when cars are not equipped with gates.

[§ I, Rules 1.010-1.040, effective 5/15/64.]

**WAC 296-84-025 Hoistway clearances.** (1) The minimum clearance between the side of the car and a hoistway enclosure shall be one inch.

(2) The clearance between the car platform and the landing sill shall not be less than one-half inch and not more than one and one-half inches.

[§ II, Rules 2.010-2.020, effective 5/15/64.]

**WAC 296-84-030 Habitable space under hoistways.** There shall be no habitable space below the elevator hoistway or counterweight shaft unless the floor is supported to withstand any impact caused by the car or counterweight dropping freely onto the floor.

[§ III, Rule 3.010, effective 5/15/64.]

**WAC 296-84-035 Hoistway guide rails.** (1) There shall be a minimum of two opposing guide rails extending to a point six inches beyond the full height of travel of the car when the counterweight buffer is fully compressed.

(2) All rails shall be supported by bolts, lag screws or other approved methods to a vertical supporting member which shall not exceed one-half inch deflection with the application of a two hundred fifty pound horizontal thrust at any point.

(3) Wood guide rails shall be at least one and one-half inch by one and one-half inch vertical grain fir or equivalent and shall not vary more than three-sixteenth inch in thickness on the sides to which the brakes make contact. All joints shall be kept smooth and even.

[§ IV, Rules 4.010-4.030, effective 5/15/64.]

**WAC 296-84-040 Buffer springs and overtravel of car.** Substantial spring buffers shall be installed below the car and also below the counterweight on all new installations. All installations shall have spring buffers attached below the counterweight. The hoisting rope shall be of such length that the car platform will not be more than eight inches above the top landing when the counterweight buffer spring is fully compressed.

[§ V, Rule 5.010, effective 5/15/64.]

**WAC 296-84-045 Car specifications.** (1) The car shall be built to the following specifications:

(a) The car platform shall be not greater than thirty inches on either side, (6.25 square feet area).

(b) The car frame and platform shall be of steel or sound seasoned wood construction and be designed with a factor of safety of not less than four for metal and six for wood, based on a maximum capacity of two hundred fifty pounds.

(c) All frame members shall be securely bolted, riveted or welded and braced. If bolted, lock washers or lock nuts must be used.

(d) Where wooden frame members are bolted, large washers or metal plates shall be used to minimize the possibility of splitting or cracking the wood.

(2) The sides of the car shall be enclosed by a minimum of two safety guard rails with the top rail not less than thirty-six inches nor more than forty-two inches from the car floor and with the intermediate bar bisecting the height. Rails shall sustain a horizontal thrust of two hundred fifty pounds. If solid material is used it shall be smooth surfaced and not less than one-half inch thickness, if wood; and not less than sixteen gauge thickness, if steel; and shall be constructed from the car floor to a height of not less than three feet.

(a) Where the hoistway is not enclosed on the entrance side of the car, a self-locking or drop bar positive stop type car gate must be provided. Car gate may be of the folding type, horizontally swung, provided it swings into the car enclosure. Drop bar gates must be of two bar construction, parallelogram type, and conform to requirements specified for car guard rails.

(b) The car gate shall drop into locking slots or be provided with a positive locking type latch capable of withstanding two hundred fifty pounds horizontal thrust.

(3) Every car shall have a substantial protective top. The front half may be hinged. The protective top may be made from number 9 U.S. wire gauge screen, 11 gauge expanded metal, 14 gauge sheet steel or three-quarter inch or heavier plywood. If made of wire screen or metal, the openings shall reject a one-half inch diameter ball.

(4) Every car shall have a proper rack to hold the balance weights.

(5) A sign bearing the following information shall be conspicuously posted within the car:

(a) Maximum capacity one person

(b) Total load limit in pounds

(c) For authorized personnel use only.

(6) Every car shall be equipped with a spring loaded foot brake which:

(a) Will operate independently of the car safeties.

(b) Will operate in both directions and will stop and hold the car and its load.

(c) Will lock the car in its position automatically whenever the operator releases the pressure on the foot pedal.

(7) Every car shall be equipped with a car safety device which will:

(a) Apply to the sides of the main guide rails.

(b) Stop and hold the car and its load immediately when the hoisting rope breaks.

(8) Every car shall have a minimum clearance of six feet six inches from the top of the car platform to the bottom edge of the crosshead or any other obstruction.

(9) A tool box with minimum dimensions of four inches wide by sixteen inches long by three inches in depth shall be provided and firmly attached to the car structure.

[§ VI, Rules 6.010-6.090, effective 5/15/64.]

**WAC 296-84-050 Counterweights.** (1) The assembly of sectional counterweight shall conform to the following requirements:

(a) Rectangular type shall be held together by at least two tie rods one-half inch in diameter fastened with lock washers and double nuts or other approved means.

(b) One three-quarter inch rod may be used to hold the sections of a round counterweight together. Any additional sections or weights shall be secured by an approved means.

(2) The eye bolt for the rope hitch shall be attached to the counterweight in a manner that will prevent the eye bolt from coming loose. The eye of eye bolts shall be welded to prevent them from opening.

(3) Every counterweight runway shall be enclosed with substantial unperforated material for its full distance of travel. Inspection openings shall be provided at either the top or bottom of the counterweight runway. These openings shall be substantially covered at all times except when actually engaged in inspection of counterweight fastenings.

(4) Workmen shall load the counterweight for the proper balance of the heaviest person using the elevator and others shall use compensating weights, which shall be available, to maintain a balance suitable for their needs.

(5) On elevators with travel of seventy-five feet or more, a compensating chain or cable shall be installed to maintain the proper balance of the counterweight to the car and load in all positions.

[§ VII, Rules 7.010-7.050, effective 5/15/64.]

**WAC 296-84-055 Sheaves.** The minimum sheave diameter shall be forty times the diameter of the ropes used, i.e., fifteen inch for three-eighths inch rope.

[§ VIII, Rule 8.010, effective 5/15/64.]

**WAC 296-84-060 Hoisting ropes.** (1) Hoisting rope shall be of good grade traction elevator wire rope, and shall:

(a) Be not less than three-eighths inches in diameter.  
 (b) Provide a factor of safety of five based on the maximum weight supported.

(c) Be of such length to prevent the counterweight from striking the overhead structure when car is at bottom landing, and prevent the car from striking the overhead before the counterweight is at its lower limit of travel.

(d) Be fastened at each end by at least three or more clamps, the "U" of the clamp bearing on the dead end of the rope.

(e) Where passed around a metal or other object less than three times the diameter of the cable, have a thimble of the correct size inserted in the eye.

(2) Approved sockets or fittings with the wire properly turned back and babbitted may be used in place of clamps noted in subsection (1)(d) above.

[§ IX, Rules 9.010-9.020, effective 5/15/64.]

**WAC 296-84-065 Operating rope.** The operating rope shall be of soft hemp or cotton at least three-quarter inch in diameter, and be securely fastened at each end and shall be in proper vertical alignment to prevent bending or cutting where it passes through the openings in the platform or the protective top of the car.

[§ X, Rule 10.010, effective 5/15/64.]

**WAC 296-84-070 Lighting.** Adequate lighting shall be provided at each landing and in the shaftway.

[§ XI, Rule 11.010, effective 5/15/64.]

**WAC 296-84-075 Overhead supports.** The overhead supporting members shall be designed, based upon impact loads, with a factor of safety of:

- (1) Nine if wood;
- (2) Five if steel.

[§ XII, Rule 12.010, effective 5/15/64.]

**WAC 296-84-080 General requirements.** (1) No person other than an employee or duly authorized person shall ride or be permitted to ride in the car.

(2) Escape ladders shall be installed to extend the full length of the hoistway and shall be located in a position whereby, in an emergency, a person can safely transfer from the car platform to the ladder. "IMPAIRED CLEARANCE" sign to be posted at bottom of ladders when face of ladder is less than thirty inches from any structure.

(3) An automatic safety dog or device shall be installed at the bottom landing which will prevent the car from leaving the landing until manually released by the operator.

(4) A fire extinguisher in proper working condition shall be attached to the car structure.

[§ XIII, Rules 13.010-13.040, effective 5/15/64.]

## Chapter 296-85 WAC

### MECHANIZED PARKING GARAGE EQUIPMENT

WAC

296-85-005 National code adopted.

**WAC 296-85-005 National code adopted.** USASI Standard A113.1-1964 "Safety Code for Mechanized Parking Garage Equipment."

[Filed 12/29/67, effective 2/1/68.]

**Reviser's note:** A part of Order 70-11, filed 9/18/70, effective date 10/21/70, states that the administration of WAC 296-85-005, Safety Code for Mechanized Parking Garage Equipment, shall be under the jurisdiction of the division of building and construction safety inspection services of the department of labor and industries.

**Reviser's note:** The A.S.A. publications are published by the American Society of Mechanical Engineers, United Engineering Center, 345, East 47th Street, New York, New York 10017.

## Chapter 296-86 WAC

### REGULATIONS AND FEES FOR FREIGHT AND PASSENGER ELEVATORS, MANLIFTS, DUMBWAITERS, ESCALATORS, MOVING WALKS, AUTOMOBILE PARKING ELEVATORS, AND PERSONNEL ELEVATORS

WAC

296-86-010 Permits for construction, alteration, relocation of installations.

296-86-020 Construction and alteration fee.

296-86-030 Installation fee for personnel elevators, material hoists, and cantilever hoists.

296-86-040 Submission of plans for new installations.

296-86-050 Fee for checking plans for new installations.

296-86-060 Annual operating permit fees.

296-86-070 Supplemental inspections.

296-86-075 Reinspection fees.

296-86-080 Fee for inspection of regular elevators being used as temporary personnel elevators.

**WAC 296-86-010 Permits for construction, alteration, relocation of installations.** Before a permit is issued for the construction, alteration, relocation, or installation of a conveyance subject to the provisions of this act, application for such a permit shall be made to the department accompanied by the fee set forth in the appropriate fee schedule in this chapter. No work shall be done until the permit has been issued. Construction and alteration permits shall be valid for one year from date of issue. Renewals may be obtained for one dollar for each permit. No permit or fee shall be required for ordering repairs and replacement of damaged, broken, or worn parts necessary for normal maintenance and no permit or fee shall be required for any conveyance exempted by RCW 70.87.200.

[Statutory Authority: RCW 70.87.030, 82-12-005 (Order 82-18), § 296-86-010, filed 5/20/82; Order 70-5, § 296-86-010, filed 6/2/70.]

**WAC 296-86-020 Construction and alteration fee.** The construction and alteration fee schedule shall be:



TOTAL COST	FEE
\$250.00 to and including \$1,000	\$ 27.50
\$1,001 to and including \$15,000	
For first \$1,001	38.50
For each additional \$1,000 or fraction	7.70
\$15,001 to and including \$100,000	
For first \$15,001	146.30
For each additional \$1,000 or fraction	5.50
Over \$100,001	
For first \$100,001	613.80
For each additional \$1,000 or fraction	4.40

[Statutory Authority: RCW 70.87.080, 70.87.090 and 70.87.100. 86-03-026 (Order 86-5), § 296-86-020, filed 1/10/86. Statutory Authority: RCW 70.87.030. 82-12-005 (Order 82-18), § 296-86-020, filed 5/20/82; Order 70-5, § 296-86-020, filed 6/2/70.]

**WAC 296-86-030 Installation fee for personnel elevators, material hoists, and cantilever hoists.** The fee for the installation of each personnel elevator, material hoist, and cantilever hoist shall be \$90.00.

[Statutory Authority: RCW 70.87.080, 70.87.090 and 70.87.100. 86-03-026 (Order 86-5), § 296-86-030, filed 1/10/86. Statutory Authority: RCW 70.87.030. 82-12-005 (Order 82-18), § 296-86-030, filed 5/20/82; Order 76-37, § 296-86-030, filed 12/3/76; Order 74-36, § 296-86-030, filed 10/1/74; Order 70-11, § 296-86-030, filed 9/18/70, effective 10/21/70; Order 70-5, § 296-86-030, filed 6/2/70.]

**WAC 296-86-040 Submission of plans for new installations.** Plans shall be submitted in duplicate to the elevator section prior to construction for approval in accordance with the American Standard Safety Code for Elevators, Dumbwaiters, Escalators and Moving Walks A 17.1-1981.

[Statutory Authority: RCW 70.87.030. 82-12-005 (Order 82-18), § 296-86-040, filed 5/20/82; Order 74-36, § 296-86-040, filed 10/1/74; Order 70-5, § 296-86-040, filed 6/2/70.]

**WAC 296-86-050 Fee for checking plans for new installations.** The fee for checking plans shall be \$20.00 for each installation.

[Order 70-5, § 296-86-050, filed 6/2/70.]

**WAC 296-86-060 Annual operating permit fees.** Fees for annual operation shall be paid in accordance with the following schedule and no operating permit shall be issued for the operation of a conveyance until such fees have been received.

CONVEYANCE	ANNUAL FEE
Each hydraulic elevator	\$ 70.00
Each cable elevator	90.00
	plus \$7.00 for each hoistway opening in excess of two.
Each cable elevator traveling more than 25 ft.	10.00 for each 25 ft.
without opening	of travel without openings.

CONVEYANCE	ANNUAL FEE
Each sidewalk freight elevator	70.00
Each hand power freight elevator	45.00
Each hand power manlift	45.00
Each incline lift	70.00
Each belt manlift	70.00
Each boat launching elevator	70.00
Each auto parking elevator	70.00
Each escalator	70.00
Each moving walk	70.00
Each dumbwaiter	45.00
Each people mover	60.00
Each stair lift	45.00
Each wheel chair lift	45.00
Each personnel elevator	70.00
Each material hoist	70.00
Each cantilever hoist	70.00

[Statutory Authority: RCW 70.87.080, 70.87.090 and 70.87.100. 86-03-026 (Order 86-5), § 296-86-060, filed 1/10/86. Statutory Authority: RCW 70.87.030. 82-12-005 (Order 82-18), § 296-86-060, filed 5/20/82; Order 76-37, § 296-86-060, filed 12/3/76; Order 74-36, § 296-86-060, filed 10/1/74; Order 71-16, § 296-86-060, filed 12/7/71; Order 70-11, § 296-86-060, filed 9/18/70, effective 10/21/70; Order 70-5, § 296-86-060, filed 6/2/70.]

**WAC 296-86-070 Supplemental inspections.** Any person, firm, corporation or governmental agency may secure supplemental inspections of conveyances by paying to the department a fee of \$258.00 per day plus the standard per diem and mileage allowed by the department to its inspectors.

[Statutory Authority: RCW 70.87.080, 70.87.090 and 70.87.100. 86-03-026 (Order 86-5), § 296-86-070, filed 1/10/86. Statutory Authority: RCW 70.87.030. 82-12-005 (Order 82-18), § 296-86-070, filed 5/20/82; Order 76-37, § 296-86-070, filed 12/3/76; Order 74-36, § 296-86-070, filed 10/1/74; Order 70-11, § 296-86-070, filed 9/18/70, effective 10/21/70.]

**WAC 296-86-075 Reinspection fees.** No fee shall be charged for the yearly inspection or for the initial inspection after installation or alteration. If, however, the conveyance does not meet the requirements of the department, and if another inspection is required to confirm compliance by the person having control over the conveyance with the regulations of the department, then an inspection fee of \$70.00 per conveyance to be inspected shall be charged for the reinspection, and if there is still failure to comply with the rules of the department, a fee of \$90.00 shall be charged for every conveyance requiring a further reinspection. These fees are in addition to the fees charged under WAC 296-86-020 and must be paid before issuance of an operating permit. The department may waive the reinspection fee where, through no fault of the requesting person or agency, or of the person or agency responsible for payment of the reinspection fee, reinspection is not possible; or for other reasons that in justice or equity obviate the necessity of payment of the reinspection fee.

[Statutory Authority: RCW 70.87.080, 70.87.090 and 70.87.100. 86-03-026 (Order 86-5), § 296-86-075, filed 1/10/86. Statutory Authority: RCW 70.87.030. 82-12-005 (Order 82-18), § 296-86-075, filed 5/20/82; Order 76-37, § 296-86-075, filed 12/3/76; Order 72-2, § 296-86-075, filed 2/25/72.]

**WAC 296-86-080 Fee for inspection of regular elevators being used as temporary personnel elevators.** The fee for the inspection and testing of regular elevators for use as temporary personnel elevators shall be \$60.00.

[Statutory Authority: RCW 70.87.030, 82-12-005 (Order 82-18), § 296-86-080, filed 5/20/82; Order 76-37, § 296-86-080, filed 12/3/76; Order 70-11, § 296-86-080, filed 9/18/70, effective 10/21/70.]

### Chapter 296-87 WAC

## SAFETY REQUIREMENTS FOR WORKMEN'S CONSTRUCTION ELEVATORS

### WAC

296-87-001	Scope.
296-87-010	Hoistway construction.
296-87-020	Guide rail brackets and building supports.
296-87-030	Hoistway enclosure.
296-87-040	Hoistway doors.
296-87-050	Landing platform.
296-87-060	Car operating and terminal stopping devices and electrical protective devices.
296-87-070	Car safeties.
296-87-080	Ropes, rope connections, data and record.
296-87-090	Car frames and platforms.
296-87-100	Capacity posting.
296-87-110	Platform size.
296-87-120	Maintenance inspection and test periods.
296-87-130	Car and counterweight buffers.

**WAC 296-87-001 Scope.** This standard applies to the design, construction, installation, operation, inspection, testing, maintenance, alterations, and repair of structures and hoists which are not a permanent part of the buildings, are installed inside or outside buildings during construction, alteration, or demolition, and are used to raise and lower workers and other persons connected with, or related to, the building project. The hoist may also be used for transportation of materials.

This standard shall not apply to the following:

- (1) Temporary elevators installed in the hoistways during the construction of buildings and incorporating a part of the permanent elevator to be installed later.
- (2) Hoists for raising and lowering materials with no provision for carrying personnel.
- (3) Manlifts, counterbalanced or endless-belt type.
- (4) Mine hoists.
- (5) Wire-rope-guided and nonguided hoists.

[Statutory Authority: RCW 70.87.080, 70.87.090 and 70.87.100. 86-03-033 (Order 86-12), § 296-87-001, filed 1/10/86.]

**WAC 296-87-010 Hoistway construction.** (1) The hoistway construction forming the supports for the machinery and guide rails shall be designed and installed to support the loads specified. Overhead beams, floors, and their supports shall be designed for not less than the sum of the following loads:

(a) The load resting on the beams and supports which shall include the complete weight of the machine sheaves, controller, governor and any other equipment together with that portion, if any, of the machine room floor supported thereon.

(b) Twice the sum of the tensions in all wire ropes passing over sheaves or drums supported by the beams with rated load in the car.

(2) Foundations, beams and floors for machinery and sheaves not located directly over the hoistway. For machines and sheaves located below or at the sides of the hoistway, the foundation for the machine and sheave beams and their supports shall be designed to withstand the following loads:

(a) The foundation shall support the total weight of the machine, sheaves and other equipment, and the floor, if any.

(b) The sheave beams and the foundation bolts shall withstand twice the vertical component of the tensions in all hoisting ropes passing over sheaves or drums on the foundation or beams, less the weight of the machine or sheaves.

(c) The sheave beams and the foundation bolts shall withstand twice the horizontal component, if any, of the tensions in all hoisting ropes passing over sheaves or drums on the foundation or beams.

(d) The foundation shall withstand twice the overturning moment, if any, developed by the tension in all the hoisting ropes passing over sheaves or drums on the foundation or beams.

[Order 70-11, § 296-87-010, filed 9/18/70, effective 10/21/70.]

**WAC 296-87-020 Guide rail brackets and building supports.** The building construction forming the supports for the guide rails and guide rail brackets shall be of such a design as to:

(1) Safely withstand the application of the car or counterweight safety when stopping the car and its rated load or the counterweight.

(2) Withstand the forces imposed by the class of loading. Where necessary the building construction shall be reinforced to provide adequate support for the guide rails.

(3) Each elevator tower shall be anchored to the building at not to exceed twenty-five foot vertical intervals, or if guy wires are used, such guys shall be not less than one-half inch wire rope and terminal fastening be tagged PERSONNEL ELEVATOR—DO NOT REMOVE.

[Statutory Authority: RCW 70.87.080, 70.87.090 and 70.87.100. 86-03-033 (Order 86-12), § 296-87-020, filed 1/10/86; Order 70-11, § 296-87-020, filed 9/18/70, effective 10/21/70.]

**WAC 296-87-030 Hoistway enclosure.** (1) Hoistways or towers located inside of buildings shall be enclosed to the full height and width on all sides where no entrances occur, and shall be constructed as specified in WAC 296-87-030(3).

(2) Hoistway or towers located outside or adjacent to buildings shall be enclosed on all four sides at their lowest landing to a height of ten feet, and to a height of ten feet throughout the entire height where entrances occur, and shall be constructed as specified in WAC 296-87-030(3).

(3) Hoistway enclosures shall be constructed of solid or openwork material conforming to the following requirements:

(a) Openwork material shall reject a ball one and one-half inches in diameter.

(b) Metal enclosures shall be made of wire at least No. 16 steel wire gage or of expanded metal at least No. 16 U.S. gage.

(c) Wood enclosures shall be installed without openings.

(d) Hoistway enclosures shall be so supported and braced that when subjected to a pressure of one hundred pounds applied horizontally at any point the deflection shall not exceed one inch.

[Order 70-11, § 296-87-030, filed 9/18/70, effective 10/21/70.]

**WAC 296-87-040 Hoistway doors.** (1) For hoistways or towers located inside of buildings the hoistway door shall guard the full height and width of the openings, and shall be so constructed as to withstand one hundred pounds applied at right angles to the center of the door without causing the door to break or be permanently deformed. Each hoistway door shall be equipped with an approved combination of electric contact and mechanical lock.

(2) For hoistways or towers located outside of buildings the hoistway door shall be not less than six feet six inches in height and shall protect the full width of the opening and shall be of strength and design conforming to the hoistway construction. Each hoistway door shall be equipped with an approved combination of electric contact and mechanical lock.

(3) An elevator shall not serve any landing that is not provided with a hoistway door.

[Statutory Authority: RCW 70.87.080, 70.87.090 and 70.87.100. 86-03-033 (Order 86-12), § 296-87-040, filed 1/10/86; Order 70-11, § 296-87-040, filed 9/18/70, effective 10/21/70.]

**WAC 296-87-050 Landing platform.** The landing platform from all hoistways or towers to the building shall be constructed to provide a safety factor of three based on the capacity of the elevator and shall be provided with adequate handrails.

[Order 70-11, § 296-87-050, filed 9/18/70, effective 10/21/70.]

**WAC 296-87-060 Car operating and terminal stopping devices and electrical protective devices.** (1) The operation shall be by car switch or constant pressure push button and shall be so arranged that the elevator car can be operated from within the car only. It shall also be equipped with an emergency stop switch located within or adjacent to the car operating panel.

(2) The travel control cable shall be attached from within the hoistway and securely fastened to the car. The control cable can be of the suspended type, retractable type, or coiled in a suitable container at the base of the tower.

(3) Terminal and final limits switches shall be installed at the upper and lower landings. These may be mounted on the car or in the hoistway operated by cams attached to the car or in the hoistway.

(4) Phase reversal and failure protection. Elevators having polyphase alternating current power supply shall

[Title 296 WAC—p 1750]

be provided with means to prevent the starting of the elevator motor if,

(a) The phase rotation is in the wrong direction, or

(b) There is a failure of any phase.

(5) Main line contactor. A contactor shall be installed in addition to the direction switches which will cut off main line current to the motor and apply the brake when any of the final terminal stopping devices operate.

(6) A fused disconnect switch of adequate size shall be installed and connected into the power supply line to the controller and be accessible at the lower terminal landing.

(7) Where the hoistway is exposed to the weather the electrical control equipment, fixtures and switches shall be weatherproof.

(8) Machinery and control equipment shall be protected from the weather, falling debris and from access by unauthorized persons. Spaces containing elevator driving machine and control equipment shall be provided with adequate lighting.

(9) All electric elevators shall be equipped with effective brakes that are released electrically and applied by springs. The brakes shall be designed to have a capacity sufficient to hold the car at rest with its rated load, and shall be mounted on the main driving shaft of the machine.

(10) The maximum speed allowable shall be three hundred feet per minute.

(11) Internal combustion engines shall not be permitted for direct drive.

[Statutory Authority: RCW 70.87.080, 70.87.090 and 70.87.100. 86-03-033 (Order 86-12), § 296-87-060, filed 1/10/86; Order 70-11, § 296-87-060, filed 9/18/70, effective 10/21/70.]

**WAC 296-87-070 Car safeties.** (1) The car of every elevator shall be provided with car safeties. The safety device shall be capable of stopping and sustaining the entire car with its rated load in the event of a free fall or overspeed.

(2) A speed governor shall be installed on all elevators and shall be so designed that it will actuate the car safeties before the car attains a speed of one hundred and forty percent of the rated speed. If a governor rope is used, it shall be not less than three-eighths inch in diameter and shall be of iron or steel material.

(3) There shall be a switch provided on the car actuated by the setting of the safeties that will remove the electric power from the driving machine motor and brake.

[Order 70-11, § 296-87-070, filed 9/18/70, effective 10/21/70.]

**WAC 296-87-080 Ropes, rope connections, data and record.** (1) Elevator cars shall be of the traction drive type suspended by steel wire ropes or approved rack and gear. If wire ropes are used, only iron (low carbon steel) or steel wire ropes with fibre cores, having the commercial classification of "elevator wire rope," shall be used for the suspension of elevator cars and for the suspension of counterweights.

(2) The minimum number of hoisting ropes used shall be three.

(3) Hoisting and counterweight wire ropes may be attached to cars and counterweights by means of approved clamps and wire rope thimbles or by approved special fastening devices. Where clamps are used, the fastening shall conform to the following:

- (a) Clamps shall not be of the U-bolt type.
- (b) Both members of the clamps shall be provided with seats conforming to the lay of the rope.
- (c) Clamps shall be drop forgings.
- (d) The ropes to be clamped shall be passed around metal thimbles having not less than the following dimensions and fastened by at least the number of clamps specified with not less than the spacing indicated in the following table.

Dia. of Wire Rope	Inside Width of Thimble	Length of Thimble In.	Min. No. of Clamps	Min. Spacing of Clamps
1/2	1 1/2	2 3/4	3	3
5/8	1 3/4	3 1/4	3	3 3/4
3/4	2	3 3/4	4	4 1/2
7/8	2 1/4	4 1/4	4	5 1/4
1	2 1/2	4 1/2	4	6

(4) Wire rope shall be taken out of service when any of the following conditions exist:

- (a) In running ropes, six randomly distributed broken wires in one lay or three broken wires in one strand in one lay;
- (b) Wear of one-third the original diameter of outside individual wires. Kinking, crushing, bird caging, or any other damage resulting in distortion of the rope structure;
- (c) Evidence of any heat damage from any cause;
- (d) Reductions from nominal diameter of more than three sixty-fourths inch for diameters to and including three-fourths inch, one sixteenth inch for diameter seven-eighths inch to one and one-eighth inches inclusive, three thirty-seconds inch for diameters one and one-fourth to one and one-half inches inclusive; and
- (e) In standing ropes, more than two broken wires in one lay in sections beyond end connections or more than one broken wire at an end connection.

[Statutory Authority: RCW 70.87.080, 70.87.090 and 70.87.100. 86-03-033 (Order 86-12), § 296-87-080, filed 1/10/86; Order 70-11, § 296-87-080, filed 9/18/70, effective 10/21/70.]

**WAC 296-87-090 Car frames and platforms.** (1) Every elevator suspended by wire ropes shall have a car frame consisting of a crosshead, uprights (stiles) and a plank located approximately at the middle of the car platform. Car frames suspended by wire ropes or cantilevered rack and gear shall be guided on each guide rail by upper and lower guiding members attached to the frame. The frame and its guiding member shall be designed to withstand the forces resulting under the loading conditions for which the elevator is designed.

(2) Every elevator car shall have a platform consisting of a nonperforated floor attached to a platform frame supported by the car frame and extending over the entire area within the car enclosure. The platform frame members and the floor shall be designed to withstand the

forces developed under the loading conditions for which the elevator is designed and installed.

(3) Materials used in the construction of car frames and platforms shall be made of steel. The platform stringers shall be made of steel or of wood.

(4) The car shall be completely enclosed with metal except where entrances occur. The car shall have a top sufficiently strong to support three hundred pounds applied at any point.

(5) A door or gate shall be provided at each entrance of the car. Each door or gate shall be equipped with an electric contact, and for cars equipped with doors away from the building or structure, a positive mechanical type lock shall be installed to prevent opening except at designated landings.

(6) Doors and gates and their guides, guide shoes, tracks, and hangers shall be so designed, constructed, and installed that when the fully closed door or gate is subjected to a force of seventy-five pounds applied on an area of one foot square at right angles to and approximately at the center of the door or gate, it will not deflect beyond the line of the car sill. When subjected to a force of two hundred and fifty pounds, similarly applied, doors and gates shall not break nor be permanently deformed, and shall not be displaced from their guides or tracks.

(7) Gates shall be constructed of metal and shall be of a design which will reject a ball two inches in diameter.

(8) Doors or gates shall guard the full width and height of the car entrance opening.

[Order 70-11, § 296-87-090, filed 9/18/70, effective 10/21/70.]

**WAC 296-87-100 Capacity posting.** Every elevator shall be provided with a capacity plate and a data plate permanently and securely fastened in place. Capacity plates shall be located in a conspicuous place inside the car. Data plates shall be attached to the car crosshead. The height of the letters and figures shall be not less than one inch for capacity plates and one inch for data plates. Capacity plates shall indicate the rated load of the elevator in pounds.

[Order 70-11, § 296-87-100, filed 9/18/70, effective 10/21/70.]

**WAC 296-87-110 Platform size.** (1) Elevators shall not exceed five thousand pounds capacity and shall not exceed a speed of three hundred feet per minute, unless specifically authorized by the department of labor and industries for each installation.

(2) Maximum inside net platform areas for the various rated loads.

Rated Load (lbs.)	Square Feet
1,000	13.25
1,200	15.6
1,500	18.9
1,800	22.1
2,000	24.2
2,500	29.1
3,000	33.7

Rated Load (lbs.)	Square Feet
3,500	38.0
4,000	42.2
5,000	50.0

[Order 70-11, § 296-87-110, filed 9/18/70, effective 10/21/70.]

**WAC 296-87-120 Maintenance inspection and test periods.** (1) A full load overspeed safety test shall be performed before the elevator is put into operation and each time the elevator is moved to a new location a full load overspeed test and inspection shall be mandatory and approved by a state inspector.

(2) Periodic maintenance shall be made by an experienced elevator mechanic at not more than thirty days, or thirty shifts, whichever occurs first. Once each shift the equipment shall be inspected by the operator to determine that the equipment is in a proper operating condition. The erection and dismantling of any personnel elevator shall be under the direct supervision of a person experienced in this type of work.

(3) Following assembly and erection of hoists, and before being put in service, an inspection and test of all functions and safety devices shall be made under the supervision of a competent person. A similar inspection and test is required following major alteration of an existing installation. All hoists shall be inspected and tested at not more than three-month intervals. Records shall be maintained and kept on file for the duration of the job.

(4) All personnel hoists used by employees shall be constructed of materials and components which meet the specifications for materials, construction, safety devices, assembly, and structural integrity as stated in the American National Standard A10.4-1981, Safety Requirements for Workmen's Hoists.

[Statutory Authority: RCW 70.87.080, 70.87.090 and 70.87.100. 86-03-033 (Order 86-12), § 296-87-120, filed 1/10/86; Order 70-11, § 296-87-120, filed 9/18/70, effective 10/21/70.]

**WAC 296-87-130 Car and counterweight buffers.** An oil or spring buffer shall be provided for the car and counterweights except cars in excess of two hundred feet per minute shall require oil buffers.

[Order 70-11, § 296-87-130, filed 9/18/70, effective 10/21/70.]

### Chapter 296-89 WAC

#### SAFETY REQUIREMENTS FOR BOAT LAUNCHING ELEVATORS

##### WAC

296-89-010	Definitions.
296-89-020	Car or platform enclosures.
296-89-030	Electric wiring.
296-89-040	Brakes.
296-89-050	Car operating and terminal stopping devices and electrical protective devices.
296-89-060	Cables.
296-89-070	Hoistway gates and doors.
296-89-080	Hoistway enclosures.

[Title 296 WAC—p 1752]

**WAC 296-89-010 Definitions.** (1) Boat launching elevator shall mean a boat launching device equipped with a car or platform which moves in guides in a substantially vertical direction and serves one or more floors or landings of a boat launching structure and a beach or water surface, and is used for the carrying or handling of boats in which people ride.

(2) Boat launching structure shall mean any structure which houses and supports any boat launching elevator.

[Order 70-11, § 296-89-010, filed 9/18/70, effective 10/21/70.]

**WAC 296-89-020 Car or platform enclosures.** All boat launching elevator cars or platforms shall be enclosed to a height of at least six feet from the floor on all sides where there are no hoistway doors or gates with solid panel or openwork which will reject a two inch ball.

[Order 70-11, § 296-89-020, filed 9/18/70, effective 10/21/70.]

**WAC 296-89-030 Electric wiring.** (1) All electric wiring used in conjunction with boat launching elevators shall be in rigid metal conduit except the traveling cable required between a terminal stopping switch mounted on the car or platform and the hoistway, which shall be of the flexible nonmetallic moisture-retardant and flame-retardant type.

(2) All electrical outlets, switches, junction boxes and fittings used in conjunction with boat launching devices shall be of the weather-proof type.

[Order 70-11, § 296-89-030, filed 9/18/70, effective 10/21/70.]

**WAC 296-89-040 Brakes.** All electric boat launching elevators shall be equipped with effective brakes that are released electrically and applied by springs. The brakes shall be designed to have a capacity sufficient to hold the elevator at rest with its rated load.

[Order 70-11, § 296-89-040, filed 9/18/70, effective 10/21/70.]

**WAC 296-89-050 Car operating and terminal stopping devices and electrical protective devices.** (1) All electric boat launching elevators shall be equipped with a bottom terminal stopping switch which is operated by a float or other approved means and the necessary traveling cable attached to the car or platform.

(2) All electric boat launching elevators shall be equipped with a top terminal stopping switch located in the hoistway which is operated by a cam attached to the car, or by other approved means.

(3) All boat launching elevators having winding drum machines shall be equipped with a final stopping switch located on and operated directly by the driving machine. This final stopping switch shall not be driven by a chain, rope or belt.

(4) All boat launching elevators driven by a polyphase alternating current motor shall be equipped with the following approved relays:

(a) Reverse phase relay. A device which will prevent starting of the driving machine motor if the phase rotation is in the wrong direction, or if there is a failure in any phase.

(b) Main line relay. A relay or contact which will automatically interrupt the power to the driving machine motor and brake and cause the brake to be applied in event of operation of any of the safety devices.

(5) Operating switches for electric boat launching elevators shall be of the key-operated continuous pressure type located outside of the hoistway and within sight of the car or platform.

(6) Hand rope controls shall not be used for any boat launching elevator.

[Order 70-11, § 296-89-050, filed 9/18/70, effective 10/21/70.]

**WAC 296-89-060 Cables.** The hoisting cables of all boat launching elevators shall be reshackled or refastened at the load end every twelve months.

[Order 70-11, § 296-89-060, filed 9/18/70, effective 10/21/70.]

**WAC 296-89-070 Hoistway gates and doors.** (1) All boat launching elevators shall be provided with hoistway entrance protection at every landing, except the beach or water surface landings, which shall comply with or be equivalent to the following minimum requirements.

(a) A full-bodied, balanced type safety gate which guards the full width of the hoistway opening and comes within two inches of the landing threshold at all points.

(b) Gate bodies shall be not less than forty-two inches in height above the threshold at the top landing and not less than sixty-six inches in height above the threshold at intermediate landings.

(c) Gates shall be constructed of metal or wood and shall be capable of withstanding a lateral pressure two hundred fifty pounds at any point without breaking or being permanently deformed, and without displacing the gate body from its guides or tracks.

(d) Openings in safety gate bodies of grille, lattice or other open work shall be of a design that will reject a two inch ball.

(2) All hoistway safety gates of a boat launching elevator shall be equipped with an approved combination electric contact and mechanical lock.

[Order 70-11, § 296-89-070, filed 9/18/70, effective 10/21/70.]

**WAC 296-89-080 Hoistway enclosures.** Boat launching elevator hoistway protection equal to and complying with all of the dimensional and pressure requirements of hoistway safety gates shall be provided on all other sides of the hoistway that are adjacent to a dock area platform, walkway or ramp.

[Order 70-11, § 296-89-080, filed 9/18/70, effective 10/21/70.]

## Chapter 296-91 WAC

### SAFETY REGULATIONS FOR CASKET LIFTS IN MORTUARIES

#### WAC

296-91-010	Scope.
296-91-020	Machine rooms and machinery spaces.
296-91-030	Equipment in machine rooms.

(1989 Ed.)

296-91-040	Electrical wiring, pipes and ducts in elevator hoistways and machine rooms.
296-91-050	Pits.
296-91-060	Protection of hoistway landing openings.
296-91-070	Hangers, guides and guide shoes for hoistway doors.
296-91-080	Location of hoistway doors.
296-91-090	Hoistway doors and door locking devices.
296-91-100	Protection of spaces below hoistways.
296-91-110	Car doors or gates.
296-91-120	Car enclosures.
296-91-130	Car frames and platforms.
296-91-140	Car frames and platform connections.
296-91-150	Capacity and loading.
296-91-160	Driving machine and sheaves.
296-91-170	Material and grooving for sheaves and drums.
296-91-180	Driving machine brakes.
296-91-190	Terminal stopping devices.
296-91-200	Ropes, rope connections, data and record.
296-91-210	Hydraulic elevators.
296-91-220	Valves, supply piping and fittings.
296-91-230	Stopping devices.
296-91-240	Operating devices.

**WAC 296-91-010 Scope.** This code applies to hoisting and lowering mechanisms equipped with cars which move in guides in a substantially vertical direction, the cars of which have a net inside area not exceeding twenty-eight square feet and a total internal height not exceeding four feet, and the width not to exceed three and one-half feet. The platform shall consist of a series of rollers and which are used exclusively for carrying caskets.

Hoistways, hoistway enclosures and related construction which is in substantial compliance with Part 1, section 100 of the American Standard Safety Code for Elevators, Dumbwaiters, Escalators and Moving Walks A17.1-1965 shall be deemed to meet the requirements of these regulations.

[Order 71-16, § 296-91-010, filed 12/7/71.]

**WAC 296-91-020 Machine rooms and machinery spaces.** Machines and their control equipment may be located inside the hoistway enclosure at the top or bottom without intervening enclosures or platforms. Machines and control equipment located outside the hoistway shall be enclosed in enclosures of incombustible material not less than six feet high. If of openwork material, the enclosure shall reject a ball two inches in diameter with a self-closing and locking door, except that control equipment located outside the hoistway may be enclosed in a metal cabinet equipped with a self-closing and locking door to prevent access by unauthorized persons. Permanent electric lighting shall be provided in all machine rooms and machinery spaces.

[Order 71-16, § 296-91-020, filed 12/7/71.]

**WAC 296-91-030 Equipment in machine rooms.** Only machinery and equipment required for the operation of the elevator shall be permitted in the elevator machine room.

[Order 71-16, § 296-91-030, filed 12/7/71.]

**WAC 296-91-040 Electrical wiring, pipes and ducts in elevator hoistways and machine rooms.** (1) Only such electrical wiring raceways and cables used directly in

[Title 296 WAC—p 1753]

connection with the elevator may be installed inside the hoistway.

(2) Pipes or ducts conveying gases, vapors or liquids and not used in connection with the elevator shall not be installed in any hoistway, machine room or machinery space.

(3) Machinery and sheave beams, supports and foundations shall comply with Section 105 of the American Standard Safety Code for Elevators, Dumbwaiters, Escalators and Moving Walks A17.1-1965.

[Order 71-16, § 296-91-040, filed 12/7/71.]

**WAC 296-91-050 Pits.** Pits are not required.

[Order 71-16, § 296-91-050, filed 12/7/71.]

**WAC 296-91-060 Protection of hoistway landing openings.** The size and location of door openings shall conform to the following:

(1) Size of openings. The width and height of door openings shall not exceed the width and height of the elevator car by more than one inch in each dimension.

EXCEPTION: One door opening may be of sufficient size to permit installing and removing the car, but shall be not more than four feet nine inches in height.

(2) Location of door opening. The bottom of the door opening shall be not less than twenty-four inches above the floor.

[Order 71-16, § 296-91-060, filed 12/7/71.]

**WAC 296-91-070 Hangers, guides and guide shoes for hoistway doors.** Hoistway doors shall be so hung and guided that the doors will not be displaced from their guides or tracks when in normal service nor when the doors are subjected to a constant horizontal force of two hundred and fifty pounds applied at right angles to and approximately the center of the door or to the center of each door section where multisection doors are used.

[Order 71-16, § 296-91-070, filed 12/7/71.]

**WAC 296-91-080 Location of hoistway doors.** Hoistway doors shall be so located that the distance from the hoistway face of the doors to the edge of the hoistway landing sill measured from the face of the door section nearest to the car shall be not more than two and one-half inches.

[Order 71-16, § 296-91-080, filed 12/7/71.]

**WAC 296-91-090 Hoistway doors and door locking devices.** Hoistway doors shall be provided which will guard the full height and width of the openings and shall be provided with a combination mechanical locks and electric contacts.

[Order 71-16, § 296-91-090, filed 12/7/71.]

**WAC 296-91-100 Protection of spaces below hoistways.** Where the space below the hoistway is used for a passageway or is occupied by persons, or if unoccupied is not secured against unauthorized access, the cars and their counterweights shall be provided with safeties

[Title 296 WAC—p 1754]

which may be operated as a result of the breaking of the suspension means and which may be of the inertia type without governors.

[Order 71-16, § 296-91-100, filed 12/7/71.]

**WAC 296-91-110 Car doors or gates.** (1) There shall be not more than two entrances to the car.

(2) Each entrance shall be provided with a car door or gate which when in fully closed position shall protect the full width and height of the car entrance opening.

(a) Collapsible type gates shall, when extended (closed position), reject a ball four and one-half inches in diameter.

[Order 71-16, § 296-91-110, filed 12/7/71.]

**WAC 296-91-120 Car enclosures.** (1) Extent of enclosures. Elevator car shall be permanently enclosed on all sides and the top.

(2) Securing of enclosures. The enclosure shall be securely fastened to the car platform and so supported that it cannot loosen or become displaced in ordinary service.

(3) Deflection of enclosure walls. The enclosure walls shall be of such strength and so designed and supported that when subjected to a pressure of seventy-five pounds applied horizontally at any point on the walls of the enclosure, the deflection will not reduce the running clearance to exceed one inch.

(4) Car top enclosure. Top of car enclosure shall be so designed and installed as to be capable of sustaining a load of three hundred pounds on any square area two feet on a side and one hundred pounds applied at any point. Simultaneous application of these loads is not required.

[Order 71-16, § 296-91-120, filed 12/7/71.]

**WAC 296-91-130 Car frames and platforms.** (1) Every elevator suspended by wire ropes shall have a car frame consisting of a crosshead, uprights (stiles), and a plank located approximately at the middle of the car platform and in no case farther from the middle than one-eighth of the distance from front of the platform.

(2) Guiding members. Car frames shall be guided on each guide rail by upper and lower guiding members attached to the frame.

(3) Materials for car frames and platform frames. Car frames and outside members of platform shall be made of steel.

[Order 71-16, § 296-91-130, filed 12/7/71.]

**WAC 296-91-140 Car frames and platform connections.** Connections between members of car frames and platform shall be riveted, bolted or welded and shall conform to the following:

(1) Bolts. Bolts where used through sloping flanges of structural members shall have boltheads of the tipped head type or shall be fitted with beveled washers.

(2) Nuts. Nuts used on sloping flanges of structural members shall seat on beveled washers.



(3) Welding. Welding of parts upon which safe operation depends shall be done in accordance with the appropriate standards established by the American Welding Society.

[Order 71-16, § 296-91-140, filed 12/7/71.]

**WAC 296-91-150 Capacity and loading.** (1) Driving machines, car and counterweight suspension means and overhead beams and supports shall be designed and installed to sustain the car with a structural capacity load based on the inside net platform area as indicated in Table No. 207.1 of the American Standard Safety Code for Elevators, Dumbwaiters, Escalators and Moving Walks A17.1-1965.

(2) Capacity plate. A metal plate shall be fastened in a conspicuous place in the car and shall give the rated load in letters and figures not less than one-fourth inch high stamped, etched or raised on the surface of the plate.

[Order 71-16, § 296-91-150, filed 12/7/71.]

**WAC 296-91-160 Driving machine and sheaves.** Types of power driving machines permitted. Driving machines shall be one of the following types:

- (1) Drum.
- (2) Traction.
- (3) Plunger.

[Order 71-16, § 296-91-160, filed 12/7/71.]

**WAC 296-91-170 Material and grooving for sheaves and drums.** Material and grooving for sheaves and drums shall:

- (1) Be of metal finished grooves.
- (2) Have a pitch diameter not less than forty times the diameter of the rope.

[Order 71-16, § 296-91-170, filed 12/7/71.]

**WAC 296-91-180 Driving machine brakes.** The elevator driving machine shall be equipped with a friction brake applied by a spring or springs and released electrically. The brake shall be designed to have a capacity sufficient to hold the car at rest with its rated load.

[Order 71-16, § 296-91-180, filed 12/7/71.]

**WAC 296-91-190 Terminal stopping devices.** (1) Upper and lower normal stopping devices shall be provided at the top and bottom of hoistway.

(2) Final terminal stopping devices shall be provided and arranged to cause the electric power to be removed from the elevator driving machine motor and brake after the car has passed a terminal landing but so that under normal operating conditions it will not function when the car is stopped by the normal terminal stopping device.

(3) Elevators having traction machines shall have final terminal stopping switches located in the hoistway and operated by cams attached to the car.

(4) Elevators having winding-drum machines shall have final terminal stopping switches located on and operated by the driving machine, which shall not be driven by chain, rope or belt. Also, stopping switches shall be

installed in the hoistway that are operated by cams attached to the car or counterweights.

(5) All elevators having winding-drum machines shall have a slack rope device with an electric switch of the enclosed manually reset type which will cause the electric power to be removed from the driving machine motor and brake if the hoisting ropes become slack.

[Order 71-16, § 296-91-190, filed 12/7/71.]

**WAC 296-91-200 Ropes, rope connections, data and record.** (1) Elevator cars shall be suspended by steel wire ropes. Only iron (low carbon steel) or steel wire ropes with fibre cores, having the commercial classification of "elevator wire rope" shall be used for the suspension of elevator cars and for the suspension of counterweights.

(2) The minimum number of hoisting ropes shall be three one-half inch ropes for traction elevators and two one-half inch ropes for drum type elevators.

(3) Fastenings shall be:

- (a) By individual tapered babbitted rope sockets or,
- (b) By other types of rope fastenings that meet the approval of the enforcing agency.

(4) The rope socket shall be of a type which will develop at least eighty percent of the braking strength of the strongest rope to be used in such fastenings and U-bolt type rope clips (clamps) shall not be used for load line fastenings.

[Order 71-16, § 296-91-200, filed 12/7/71.]

**WAC 296-91-210 Hydraulic elevators.** (1) Shall be of the plunger type.

(2) The plunger shall be securely attached to the car platform.

(3) Plungers composed of more than one section shall have the joints designed and constructed to carry in tension the weight of all plunger sections below the joints.

(4) Plungers shall be provided with solid metal stops to prevent the plunger from traveling beyond the limits of the cylinder. Stops shall be so designed and constructed as to stop the plunger from maximum speed in the "up" direction under full pressure without damage to the hydraulic system.

(5) Means shall be provided to collect any oil leakage.

[Order 71-16, § 296-91-210, filed 12/7/71.]

**WAC 296-91-220 Valves, supply piping and fittings.**

(1) Valves, piping and fittings shall not be subjected to working pressures exceeding those recommended by the manufacturer for the type of service for which they are used.

(2) Piping shall be so supported as to eliminate undue stresses at joints and fittings particularly at any section of the line subject to vibration.

(3) A shut-off valve shall be installed in the pit.

(4) Each pump shall be equipped with a relief valve conforming to the following requirements:

(a) Type and location. The relief valve shall be located between the pump and the check valve and shall be of such type and so installed in a by-pass connection

that the valve cannot be shut off from the hydraulic system.

(b) Setting. The relief valve shall be pre-set to open at a pressure not greater than one hundred and twenty-five percent of the working pressure at the pump.

EXCEPTION: No relief valve is required for centrifugal pump driven by induction motors providing the shut-off or maximum pressure which the pump can develop is not greater than one hundred thirty-five percent of the working pressure at pump.

(c) Check valve. A check valve shall be provided and shall be so installed that it will hold the elevator car with rated load at any point when the pump stops or the maintained pressure drops below the minimum operating pressure.

[Order 71-16, § 296-91-220, filed 12/7/71.]

**WAC 296-91-230 Stopping devices.** (1) Normal stopping devices shall be installed at the top and bottom of the hoistway operated by cams attached to the car.

(2) Final terminal stopping devices are not required.

(3) Anti-creep leveling devices are not required.

[Order 71-16, § 296-91-230, filed 12/7/71.]

**WAC 296-91-240 Operating devices.** The operation of the elevator shall be from outside the hoistway only and shall be of the constant pressure or automatic types.

[Order 71-16, § 296-91-240, filed 12/7/71.]

### Chapter 296-93 WAC MATERIAL LIFTS

#### WAC

296-93-010	Scope.
296-93-020	Hoistway enclosures.
296-93-030	Hoistway enclosure gates and doors.
296-93-040	Hoistways that do not extend to the lowest area of a building or structure.
296-93-050	Driving machines and equipment.
296-93-070	Car enclosures.
296-93-080	Running clearance.
296-93-090	Car and counterweight guides.
296-93-100	Car loading.
296-93-120	Car operating and terminal stopping devices and electrical protective devices.
296-93-140	Car safeties.
296-93-150	Brakes.
296-93-160	Ropes and chains—Rope connections, data, and records.
296-93-170	Controls.
296-93-190	When material lift pit is provided.
296-93-200	Illumination of landings.
296-93-210	Capacity posting and no-riders sign.
296-93-220	Electrical wiring.
296-93-230	Guarding of exposed equipment.
296-93-240	Maintenance.
296-93-250	Installation permit.
296-93-260	New installation—Alteration or relocation.
296-93-270	Yearly inspections.
296-93-280	Operating permit.
296-93-290	Five-year tests.
296-93-300	Submission of plans for new installations.
296-93-320	Construction, alteration, and relocation fees.
296-93-330	Annual operating permit fee.

[Title 296 WAC—p 1756]

#### DISPOSITION OF SECTIONS FORMERLY CODIFIED IN THIS CHAPTER

296-93-060	Hydraulic material lifts. [Statutory Authority: RCW 70.87.030. 84-10-025 (Order 84-7), § 296-93-060, filed 4/27/84.] Repealed by 86-03-030 (Order 86-9), filed 1/10/86. Statutory Authority: RCW 70.87.080, 70.87.090 and 70.87.100.
296-93-110	Car doors and gates. [Statutory Authority: RCW 70.87.030. 84-10-025 (Order 84-7), § 296-93-110, filed 4/27/84.] Repealed by 86-03-030 (Order 86-9), filed 1/10/86. Statutory Authority: RCW 70.87.080, 70.87.090 and 70.87.100.
296-93-130	Stop switch. [Statutory Authority: RCW 70.87.030. 84-10-025 (Order 84-7), § 296-93-130, filed 4/27/84.] Repealed by 86-03-030 (Order 86-9), filed 1/10/86. Statutory Authority: RCW 70.87.080, 70.87.090 and 70.87.100.
296-93-180	Pipes and ducts. [Statutory Authority: RCW 70.87.030. 84-10-025 (Order 84-7), § 296-93-180, filed 4/27/84.] Repealed by 86-03-030 (Order 86-9), filed 1/10/86. Statutory Authority: RCW 70.87.080, 70.87.090 and 70.87.100.

**WAC 296-93-010 Scope.** This chapter sets the requirements for construction, installation, and operation of material lifts. The purpose of this chapter is to allow certain conveyances that meet the definition of "elevator" in chapter 70.87 RCW, but that are designed solely to transport materials and equipment, to be constructed in accordance with standards less stringent and costly than those contained in ANSI A17.1. The standards contained in this chapter ensure, to the extent possible, that no persons will ride material lifts, and that persons working near the material lifts are free from dangers posed by the operation or failure of the material lifts.

"Material lift" means a fixed stationary conveyance that:

- (1) Has a car or platform that moves in guides;
- (2) Serves two or more floors or landings of a building or structure;
- (3) Has a vertical rise of at least five feet and no more than sixty feet;
- (4) Has a maximum speed of fifty feet per minute;
- (5) Is an isolated self-contained lift and is not a part of a conveying system;
- (6) Travels in an inclined or vertical, but not horizontal, direction;
- (7) Is operated only by, or under the direct supervision of an individual designated by the employer; and
- (8) Is installed in a commercial or industrial area, and not in an area that is open to access by the general public; and
- (9) Shall comply with chapter 296-24 WAC.

This chapter does not cover conveyances described in ANSI B20 that do not have a car or platform but instead are provided with rollers, belts, tracks, power conveyors, or similar carrying surfaces or means of loading.

[Statutory Authority: RCW 70.87.080, 70.87.090 and 70.87.100. 86-03-030 (Order 86-9), § 296-93-010, filed 1/10/86. Statutory Authority: RCW 70.87.030. 84-10-025 (Order 84-7), § 296-93-010, filed 4/27/84.]

**WAC 296-93-020 Hoistway enclosures.** (1) Local codes and ordinances, where they exist, govern the fire-resistance requirements for hoistway enclosures.

(1989 Ed.)

(2) Unless a local jurisdiction's fire-resistance codes or ordinances otherwise require, a hoistway shall be enclosed to a height of seven feet above each floor or landing and above the treads of any adjacent stairways. Adjacent to any counterweights, the enclosure must extend the full height of the floor and extend eight inches past the counterweight raceway. The enclosing material shall be solid or have openings that do not exceed two inches in diameter.

(3) A hoistway enclosure shall be supported and braced so that it does not deflect over one inch when it is subjected to a force of one hundred pounds applied perpendicularly at any point.

[Statutory Authority: RCW 70.87.030, 84-10-025 (Order 84-7), § 296-93-020, filed 4/27/84.]

**WAC 296-93-030 Hoistway enclosure gates and doors.** The openings at each material lift landing must have gates or doors that guard the full width of the opening. A hoistway door shall be vertically sliding, bi-parting, counter-balanced, or horizontally swinging or sliding. Gates and doors must meet the following requirements:

(1) A balanced type vertically sliding hoistway gate must extend from not more than two inches from the landing threshold to not less than sixty-six inches above the landing threshold.

(2) A gate must be solid or openwork of a design that will reject a ball two inches in diameter. A gate shall be located so that the distance from the hoistway face of the gate to the hoistway edge of the landing sill is not more than two and one-half inches. A gate shall be designed and guided so that it will withstand a lateral pressure of one hundred pounds applied at approximately its center without breaking or being permanently deformed and without displacing the gate from its guides or tracks.

(3) Hoistway gates or doors shall have a combination mechanical lock and electric contact, which shall prevent operation of the material lift by the normal operating devices unless the door or gate is closed.

[Statutory Authority: RCW 70.87.030, 84-10-025 (Order 84-7), § 296-93-030, filed 4/27/84.]

**WAC 296-93-040 Hoistways that do not extend to the lowest area of a building or structure.** If the space directly below a material lift hoistway is not permanently secured against access, the following requirements apply:

(1) The material lift counterweights shall be provided with safeties.

(2) The cars and counterweights shall be provided with spring or oil buffers that conform to the following:

(a) Spring buffers shall be provided for material lifts.

(b) Spring buffers shall be designed and installed so that they will not be fully compressed when struck either by the car carrying its rated load or by the counterweight when the car or the counterweight is moving at the following speeds:

(i) The tripping speed of the governor if the safety is operated by a governor.

(ii) One hundred twenty-five percent of the rated speed if the safety is not operated by a governor.

(3) The car and counterweight-buffer supports shall be sufficiently strong to withstand, without permanent deformation, the impact resulting from engagement of the buffer at the following speeds:

(a) The tripping speed of the governor with the rated capacity, if the safety is operated by a governor.

(b) One hundred twenty-five percent of the rated speed if the safety is not operated by a governor.

[Statutory Authority: RCW 70.87.030, 84-10-025 (Order 84-7), § 296-93-040, filed 4/27/84.]

**WAC 296-93-050 Driving machines and equipment.** A material hoist shall use a winding drum, traction, direct plunger, hydraulic, roped or chained hydraulic, rack and pinion, roller chain drive, scissors, or screw-type driving machine.

(1) Driving machines located overhead shall be secured to and supported on or from the top of overhead beams or floor. Suspension of a driving machine by hooks, cables, chains, or similar devices is prohibited.

(2) The diameter of drive sheaves for traction machines may not be less than thirty times the diameter of the hoisting cables. The diameter of all other sheaves of a traction machine may be not less than twenty-one times the diameter of the hoisting cables.

[Statutory Authority: RCW 70.87.080, 70.87.090 and 70.87.100, 86-03-030 (Order 86-9), § 296-93-050, filed 1/10/86. Statutory Authority: RCW 70.87.030, 84-10-025 (Order 84-7), § 296-93-050, filed 4/27/84.]

**WAC 296-93-070 Car enclosures.** A material lift car that serves more than one landing shall be enclosed with solid panels or openwork that will reject a two-inch ball. The enclosure must extend to a height of at least forty-eight inches from the floor on each side on which there is no hoistway door or gate, except that on the side of the car that is next to the counterweight runway, the enclosure shall extend to the car top or underside of car crosshead and shall extend six inches on each side of the counterweight runway.

[Statutory Authority: RCW 70.87.080, 70.87.090 and 70.87.100, 86-03-030 (Order 86-9), § 296-93-070, filed 1/10/86. Statutory Authority: RCW 70.87.030, 84-10-025 (Order 84-7), § 296-93-070, filed 4/27/84.]

**WAC 296-93-080 Running clearance.** The running clearance between the car sill and a hoistway face shall not exceed two inches.

[Statutory Authority: RCW 70.87.030, 84-10-025 (Order 84-7), § 296-93-080, filed 4/27/84.]

**WAC 296-93-090 Car and counterweight guides.** Car and counterweight guides shall be securely fastened and may not deflect more than one-eighth inch. Guide rails must be sufficiently strong to withstand, without deformation, the application of the safety when stopping the car at the rated speed with the rated load.

[Statutory Authority: RCW 70.87.030, 84-10-025 (Order 84-7), § 296-93-090, filed 4/27/84.]

**WAC 296-93-100 Car loading.** Car frame and platforms shall be designed to withstand the impact of the gross loading imposed during loading and unloading.

[Statutory Authority: RCW 70.87.030. 84-10-025 (Order 84-7), § 296-93-100, filed 4/27/84.]

**WAC 296-93-120 Car operating and terminal stopping devices and electrical protective devices.** (1) All devices that operate by electricity shall be enclosed.

(2) A material lift that is driven by a winding drum machine shall have a slack rope device with an enclosed electric switch, of the manually reset type, that will remove the electric power from the driving machine and brake if the hoisting ropes become slack.

[Statutory Authority: RCW 70.87.080, 70.87.090 and 70.87.100. 86-03-030 (Order 86-9), § 296-93-120, filed 1/10/86. Statutory Authority: RCW 70.87.030. 84-10-025 (Order 84-7), § 296-93-120, filed 4/27/84.]

**WAC 296-93-140 Car safeties.** (1) Every material lift that is suspended by wire ropes or chains must have car safeties. The car safeties must be able to stop and sustain the car with one hundred twenty-five percent of its rated load if the hoisting means fails.

(2) Material lifts driven by rack and pinion machines have safeties consisting of a freely rotating safety pinion, an overspeed governor, and a safety device that may form an integral unit mounted on the car. The freely rotating pinion travels on a stationary rack mounted vertically in the hoistway. The rotating pinion drives the overspeed governor. When the downward speed of the car reaches the tripping speed, the rotating overspeed governor actuates the safety device which, in turn, brings the car to a gradual stop.

[Statutory Authority: RCW 70.87.030. 84-10-025 (Order 84-7), § 296-93-140, filed 4/27/84.]

**WAC 296-93-150 Brakes.** Each electric material lift shall be equipped with effective brakes that are released electrically and applied by springs. The brakes must have a capacity sufficient to stop the car, and hold the car at rest, with one hundred twenty-five percent of its rated load. At least one brake shall be mounted on the worm shaft of the driving machine. The brakes on each indirectly-driven material lift must set if the driving means fails.

[Statutory Authority: RCW 70.87.030. 84-10-025 (Order 84-7), § 296-93-150, filed 4/27/84.]

**WAC 296-93-160 Ropes and chains--Rope connections, data, and records.** (1) Only iron (low carbon steel) or steel wire ropes with fibre cores shall be used for the suspension of material lift cars and for the suspension of counterweights.

(2) At least three hoisting ropes shall be used for a traction material lift and at least two shall be used for a drum material lift, or a secondary as well as primary load path to the hoist.

(3) The minimum factor of safety for suspension ropes shall be six times the manufacturer's rated breaking strength per rope.

[Title 296 WAC—p 1758]

(4) The owner, operator, and installer of a material lift that is suspended by hoisting chains shall comply with the chain manufacturer's specifications for maintenance, inspection, and application. On material lifts using lifting chains of the roller chain type, the chains must have a six-to-one factor of safety, based on the A.N.S.I. minimum chain strength, not on average chain strength.

(5) The car and the counterweight ends of the car, and counterweight wire ropes or the stationary hitch ends where multiple roping is used, shall be fastened so that the looped ends of the turned back portion in the rope sockets shall be readily visible. Fastenings shall be:

(a) Individual tapered, babbitted rope sockets; or

(b) Other types of rope fastenings that meet the approval of the department.

(6) The rope sockets must develop at least eighty percent of the breaking strength of the strongest rope to be used in the sockets. U-bolt rope clips (clamps) may not be used for load fastenings.

(7) A metal or plastic data tag shall be securely attached to one of the wire rope fastenings each time the ropes are replaced or reshackled. The data tag shall include the diameter of the rope in inches and the manufacturer's rated breaking strength.

(8) All replacements of wire rope or chain must be in accordance with the specifications of the manufacturer of the material lift.

(9) The cable secured to the winding drum shall not be less than one and one-half turns around the drum when the carrier is at the extreme limit of travel.

[Statutory Authority: RCW 70.87.030. 84-10-025 (Order 84-7), § 296-93-160, filed 4/27/84.]

**WAC 296-93-170 Controls.** (1) The control station shall be remotely mounted so that it is inaccessible from the material lift car.

(2) Controls shall be clearly marked or labeled to indicate the function of control.

(3) All control stations shall have a stop switch. When opened, the stop switch shall remove the electrical power from the driving machine and brake. The stop switch shall:

(a) Be manually operated;

(b) Have red operating handles or buttons;

(c) Be conspicuously and permanently marked "STOP"; and

(d) Indicate the stop and run position.

[Statutory Authority: RCW 70.87.080, 70.87.090 and 70.87.100. 86-03-030 (Order 86-9), § 296-93-170, filed 1/10/86. Statutory Authority: RCW 70.87.030. 84-10-025 (Order 84-7), § 296-93-170, filed 4/27/84.]

**WAC 296-93-190 When material lift pit is provided.** (1) A material lift pit that extends to or into the ground shall have noncombustible floors, and shall be designed to prevent entry of ground water into the pit. The floor of the pit shall be approximately level. Drains

connected directly to sewers may not be installed in material lift pits. Safe and convenient access shall be provided to all pits. An approved ladder shall be provided for pits that are over three feet deep.

(2) Unperforated metal guards shall be installed in the pit on the open sides of the counterweights to which spring or solid-type buffers or oil buffers are attached. Guards shall extend from a point not more than twelve inches above the pit floor to a point not less than seven feet nor more than eight feet above the floor, and shall be fastened to a metal frame properly reinforced and braced to be at least equal in strength and stiffness to No. 14 U.S. gauge sheet steel. If compensating chains or ropes are attached to the counterweight on the side facing the material lift car, the guard may be omitted on the side facing the material lift car.

[Statutory Authority: RCW 70.87.030. 84-10-025 (Order 84-7), § 296-93-190, filed 4/27/84.]

**WAC 296-93-200 Illumination of landings.** All landings shall be illuminated.

[Statutory Authority: RCW 70.87.080, 70.87.090 and 70.87.100. 86-03-030 (Order 86-9), § 296-93-200, filed 1/10/86. Statutory Authority: RCW 70.87.030. 84-10-025 (Order 84-7), § 296-93-200, filed 4/27/84.]

**WAC 296-93-210 Capacity posting and no-riders sign.** (1) Each material lift shall have a capacity sign permanently and securely fastened in place in the material lift car and on the landings. The sign shall indicate the rated load of the material lift in pounds. The sign shall be metal with black letters two inches high on yellow background.

(2) A sign stating, "NO RIDERS" shall be conspicuously and securely posted on the landing side of all hoistway gates and doors and in the enclosure of each material lift car. The sign shall be metal with black letters two inches high on red background.

[Statutory Authority: RCW 70.87.080, 70.87.090 and 70.87.100. 86-03-030 (Order 86-9), § 296-93-210, filed 1/10/86. Statutory Authority: RCW 70.87.030. 84-10-025 (Order 84-7), § 296-93-210, filed 4/27/84.]

**WAC 296-93-220 Electrical wiring.** All electrical wiring, installations, and equipment in hoistways and machine rooms shall conform to the requirements of the 1984 edition of the National Electrical Code.

[Statutory Authority: RCW 70.87.080, 70.87.090 and 70.87.100. 86-03-030 (Order 86-9), § 296-93-220, filed 1/10/86. Statutory Authority: RCW 70.87.030. 84-10-025 (Order 84-7), § 296-93-220, filed 4/27/84.]

**WAC 296-93-230 Guarding of exposed equipment.** Guards to protect against accidental contact shall be provided for gears, sprockets, sheaves, drums, ropes, and chains in machine rooms and machinery spaces in accordance with Washington Industrial Safety and Health Act standards. See WAC 296-24-150.

[Statutory Authority: RCW 70.87.080, 70.87.090 and 70.87.100. 86-03-030 (Order 86-9), § 296-93-230, filed 1/10/86. Statutory Authority: RCW 70.87.030. 84-10-025 (Order 84-7), § 296-93-230, filed 4/27/84.]

**WAC 296-93-240 Maintenance.** All material lifts covered under this chapter, both existing and new, and all parts of the material lifts shall be maintained in a safe condition. All devices and safeguards that are required by this chapter shall be maintained in good working order. The owner of a material lift, or his or her designated agent, is responsible for the maintenance of the material lift and its parts.

[Statutory Authority: RCW 70.87.030. 84-10-025 (Order 84-7), § 296-93-240, filed 4/27/84.]

**WAC 296-93-250 Installation permit.** (1) An installation permit shall be obtained from the department before erecting, installing, relocating, or altering a material lift.

(2) The installer of the material lift shall submit an application for permit in duplicate, in a form that the department shall prescribe.

(3) The permit issued by the department shall be kept posted conspicuously at the site of installation.

(4) No permit is required for repairs and replacement normally necessary for maintenance and made with parts of equivalent materials, strength, and design.

[Statutory Authority: RCW 70.87.030. 84-10-025 (Order 84-7), § 296-93-250, filed 4/27/84.]

**WAC 296-93-260 New installation--Alteration or relocation.** Each new installation, alteration, or relocation shall, on its completion and before being placed in service, be inspected to determine that the installation complies with this chapter. The inspection shall include tests of the safety devices with one hundred twenty-five percent of the capacity load.

[Statutory Authority: RCW 70.87.030. 84-10-025 (Order 84-7), § 296-93-260, filed 4/27/84.]

**WAC 296-93-270 Yearly inspections.** The department shall cause all material lifts to be inspected and tested at least once each year. Inspectors have the right during reasonable hours to enter into and upon any building or premises in the discharge of their official duties, for the purpose of making any inspection or testing any conveyance contained thereon or therein. Inspections and tests shall conform with this chapter.

[Statutory Authority: RCW 70.87.030. 84-10-025 (Order 84-7), § 296-93-270, filed 4/27/84.]

**WAC 296-93-280 Operating permit.** An operating permit is required for each material lift operated in the state of Washington except during its erection by the person or firm responsible for its installation. A permit issued by the department shall be kept conspicuously posted near the conveyance.

[Statutory Authority: RCW 70.87.030. 84-10-025 (Order 84-7), § 296-93-280, filed 4/27/84.]

**WAC 296-93-290 Five-year tests.** A five-year test of the car and counterweight safety devices shall be conducted with capacity load and a report of the test results shall be submitted to the department for approval.

Persons who are qualified to test a material lift are:

(1) A representative of a firm or manufacturer that is regularly engaged in installing or servicing material lifts.

(2) A person who has demonstrated to the department his or her ability to inspect and test a material lift.

[Statutory Authority: RCW 70.87.030. 84-10-025 (Order 84-7), § 296-93-290, filed 4/27/84.]

**WAC 296-93-300 Submission of plans for new installations.** Plans shall be submitted in duplicate for approval to the conveyance section of the department before construction. The fee for checking plans is twenty dollars for each installation.

[Statutory Authority: RCW 70.87.030. 84-10-025 (Order 84-7), § 296-93-300, filed 4/27/84.]

**WAC 296-93-320 Construction, alteration, and relocation fees.** The construction, alteration, and relocation fees are:

TOTAL COST	FEE
\$250.00 to and including \$1,000.....	\$25.00
\$1,001 to and including \$15,000	
For first \$1,001 .....	35.00
For each additional \$1,000 or fraction.	7.00
\$15,001 to and including \$100,000	
For first \$15,001 .....	133.00
For each additional \$1,000 or fraction.	5.00
Over \$100,001	
For first \$100,001 .....	558.00
For each additional \$1,000 or fraction.	4.00

[Statutory Authority: RCW 70.87.030. 84-10-025 (Order 84-7), § 296-93-320, filed 4/27/84.]

**WAC 296-93-330 Annual operating permit fee.** The fee for an annual operating permit is sixty dollars for each material lift. No operating permit shall be issued for the operation of a material lift until the department has received the fee.

[Statutory Authority: RCW 70.87.030. 84-10-025 (Order 84-7), § 296-93-330, filed 4/27/84.]

**Chapter 296-94 WAC  
SAFETY RULES GOVERNING THE  
CONSTRUCTION, OPERATION, MAINTENANCE  
AND INSPECTION OF INCLINED PASSENGER  
LIFTS FOR PRIVATE USE**

WAC	
296-94-010	Scope.
296-94-020	Definitions.
296-94-030	Approval of plans and specifications.
296-94-040	Protection required.
296-94-050	Landing enclosures and gates—Where required.
296-94-060	Bumpers and buffers.
296-94-070	Machinery beams and supports.
296-94-080	Platform area and rated load.
296-94-090	Rated speed.
296-94-100	Car and chassis construction.
296-94-110	Car enclosures.
296-94-120	Car doors or gates.
296-94-130	Use of glass and plastics.
296-94-140	Data plates.

296-94-150	Guide and track supports and fastenings.
296-94-160	Counterweight guiding and construction.
296-94-170	Car safeties and governors.
296-94-180	Driving machines and sheaves.
296-94-190	Terminal stopping switches.
296-94-200	Operation.
296-94-210	Suspension means.
296-94-220	Traveling cable(s).
296-94-230	Electric wiring.
296-94-240	Track(s)/guide(s) supporting structure.
296-94-250	Means of egress.

**WAC 296-94-010 Scope.** These regulations apply to the construction, operation, maintenance, and inspection of all inclined passenger lifts for private use installed in the state of Washington.

[Statutory Authority: RCW 70.87.080, 70.87.090 and 70.87.100. 86-03-032 (Order 86-11), § 296-94-010, filed 1/10/86.]

**WAC 296-94-020 Definitions.** (1) "Inclined passenger lift" means a device constructed and operated for transporting persons from one elevation to another and consisting essentially of a car or platform traveling on guide rails in an inclined plane. For the purpose of these rules, the terms "inclined passenger lifts" shall have the same meaning as the terms "passenger elevator" as defined by RCW 70.87.010 (4)(a).

(2) Devices installed indoors on stairways and utilizing chairs for carrying passengers are not considered as being inclined passenger lifts insofar as these regulations are concerned.

(3) "Enforcing authority" means the division of building and construction safety inspection services of the department of labor and industries.

[Statutory Authority: RCW 70.87.080, 70.87.090 and 70.87.100. 86-03-032 (Order 86-11), § 296-94-020, filed 1/10/86.]

**WAC 296-94-030 Approval of plans and specifications.** (1) Before commencing construction of any inclined passenger lift the owner shall submit complete plans and specifications to the enforcing authority for approval.

(2) Plans and specifications covering the installation of an inclined passenger lift shall be endorsed by a professional engineer before approval by the enforcing authority will be considered.

[Statutory Authority: RCW 70.87.080, 70.87.090 and 70.87.100. 86-03-032 (Order 86-11), § 296-94-030, filed 1/10/86.]

**WAC 296-94-040 Protection required.** If the car sides extend less than six feet above the floor of the car, there shall be no obstruction along the runway with the arc with a twenty-four inch radius whose center is the outer corner of the top rail of the car enclosure.

EXCEPTION: When solid guards are installed on the obstruction in both directions of travel which project at least fourteen inches in line with the direction of travel, the running clearance may be reduced to seven inches. The exposed edge of the guard shall be rounded to eliminate shear hazards.

[Statutory Authority: RCW 70.87.080, 70.87.090 and 70.87.100. 86-03-032 (Order 86-11), § 296-94-040, filed 1/10/86.]

**WAC 296-94-050 Landing enclosures and gates--Where required.** (1) Landing enclosures. Where a landing platform is provided or if a portion of an existing structure is used as a landing platform, it shall be protected by a railing no less than forty-two inches high.

(2) Landing gates. The opening in the railing shall be guarded by a gate to a height equal to that of the railing. The gates may be of the horizontally sliding or swing type and shall be equipped with a lock and an electrical contact to prevent movement of the car with a gate open.

[Statutory Authority: RCW 70.87.080, 70.87.090 and 70.87.100. 86-03-032 (Order 86-11), § 296-94-050, filed 1/10/86.]

**WAC 296-94-060 Bumpers and buffers.** (1) Solid bumpers. For rated speeds not exceeding fifty feet per minute, if spring or equivalent type buffers are not used, solid bumpers shall be installed.

(2) Construction and requirements for solid bumpers. Solid bumpers shall be made of wood or other suitable resilient material of sufficient strength to withstand without failure the impact of the car with rated load or the counterweight, descending at one hundred fifteen percent of the rated speed. The material used shall be of a type which will resist deterioration or be so treated as to resist deterioration.

(3) Spring buffers. For speeds exceeding fifty feet per minute buffers of the spring type shall be installed.

(4) Construction and requirements for spring buffers. Spring buffers shall be constructed so as to have a minimum stroke of three-quarters of an inch and a maximum stroke of one and one-half inches and shall not be fully compressed when struck by the car with its rated load or counterweight traveling at one hundred fifteen percent of the rated speed.

[Statutory Authority: RCW 70.87.080, 70.87.090 and 70.87.100. 86-03-032 (Order 86-11), § 296-94-060, filed 1/10/86.]

**WAC 296-94-070 Machinery beams and supports.**

(1) Securing of machinery beams and type of supports. All machinery and sheaves shall be so supported and secured as to effectually prevent any part becoming loose or displaced. Beams directly supporting machinery shall be of steel or sound timber or reinforced concrete.

(2) Loads on beams and supports. Loads on beams and their supports shall be computed as follows:

(a) The total load on the beams shall be equal to the weight of all apparatus resting on the beams plus twice the maximum load suspended from the beams.

(b) The load resting on the beams shall include the complete weights of the driving machine, sheaves, controller, etc.

(c) The load suspended from the beams shall include the sum of the tensions in all ropes suspended from the beams.

(3) Fastening of driving machines and sheaves to underside of beams. The elevator driving machine or sheaves shall not be fastened to the underside of the supporting beams at the top of the hoistway.

EXCEPTION: Idlers or deflecting sheaves with their guards and frames. Cast iron in tension shall not be used

for supporting members for sheaves where they are hung beneath beams.

(4) Factor of safety of beams and supports. The factor of safety for beams and their supports shall be not less than:

- For steel . . . . . 5
- For timber and reinforced concrete . . . . . 6

[Statutory Authority: RCW 70.87.080, 70.87.090 and 70.87.100. 86-03-032 (Order 86-11), § 296-94-070, filed 1/10/86.]

**WAC 296-94-080 Platform area and rated load.** (1) Rated load. The rated load shall not exceed seven hundred pounds.

(2) Platform area. The inside net platform area shall not exceed twelve square feet.

EXCEPTION: The net platform area may be increased by not more than three square feet provided that shelves or benches permanently affixed to the car structure reduce the standing area to twelve square feet.

[Statutory Authority: RCW 70.87.080, 70.87.090 and 70.87.100. 86-03-032 (Order 86-11), § 296-94-080, filed 1/10/86.]

**WAC 296-94-090 Rated speed.** The rated speed measured along the incline shall not exceed seventy-five feet per minute.

[Statutory Authority: RCW 70.87.080, 70.87.090 and 70.87.100. 86-03-032 (Order 86-11), § 296-94-090, filed 1/10/86.]

**WAC 296-94-100 Car and chassis construction.** (1)

Car and platform. Inclined lift cars shall have metal or combination metal and wood, or other materials of equal strength, frames and platforms. Car frames and platforms shall have a factor of safety of not less than five based on the rated load, all suitably prepared and/or protected for exposure to the weather.

(2) Chassis construction. Inclined lift chassis shall be constructed of metal, except for guiding members. Chassis shall have a factor of safety of not less than five, based on the rated load. The chassis guiding members shall be retained and/or enclosed in guide(s)/track(s) in such a manner that the chassis cannot be derailed.

(3) Use of cast iron. Cast iron shall not be used in the construction of any member of the car frame or chassis.

(4) Number of compartments. The car shall not have more than one compartment.

[Statutory Authority: RCW 70.87.080, 70.87.090 and 70.87.100. 86-03-032 (Order 86-11), § 296-94-100, filed 1/10/86.]

**WAC 296-94-110 Car enclosures.** (1) Enclosures required. Except at the entrance, cars shall be enclosed on all sides to a height of not less than forty-two inches. The enclosure material will be of a design that will reject a ball one and one-half inches in diameter.

(2) Securing of enclosures. The enclosure shall be securely fastened to the car platform and so supported that it cannot loosen or become displaced in ordinary service or on the application of the car safety or on buffer engagement.

(3) Deflection of enclosure walls. The enclosure walls shall be of such strength and so designed and supported that when subjected to a pressure of seventy-five pounds



applied horizontally at any point on the walls of the enclosure, the deflection will not reduce the running clearance below three-quarter inch, nor to exceed one inch.

[Statutory Authority: RCW 70.87.080, 70.87.090 and 70.87.100. 86-03-032 (Order 86-11), § 296-94-110, filed 1/10/86.]

**WAC 296-94-120 Car doors or gates.** (1) Doors or gates required. A car door or gate which, when closed, will guard the opening to a height of at least forty-two inches, shall be provided at each entrance to the car. Car doors may be of solid or openwork construction which will reject a ball three inches in diameter.

(2) Door or gate electric contacts. Car doors or gates shall be provided with an electric contact which will prevent operation of the elevator by the operating device unless the car door or gate is within two inches of full closure.

(3) Manual operation. Car doors or gates shall be manually operated.

(4) Latching of swing gate. If the car gate is of the swing type opening outward from the car, the contact in WAC 296-94-140 shall not make until the gate is securely latched.

[Statutory Authority: RCW 70.87.080, 70.87.090 and 70.87.100. 86-03-032 (Order 86-11), § 296-94-120, filed 1/10/86.]

**WAC 296-94-130 Use of glass and plastics.** (1) Tempered safety glass and plastics. Tempered safety glass and plastics conforming to the requirements of subsection (2) of this section may be used.

(2) Weather resistant plastics. Plastics shall be of a weather resistant type.

[Statutory Authority: RCW 70.87.080, 70.87.090 and 70.87.100. 86-03-032 (Order 86-11), § 296-94-130, filed 1/10/86.]

**WAC 296-94-140 Data plates.** (1) Capacity plates. A weather resistant capacity plate shall be provided by the manufacturer and fastened in a conspicuous place in the car stating the rated load in pounds, letters, and figures not less than one-fourth inch.

(2) Data plates. A metal data plate shall be provided by the manufacturer stating the weight of the car, speed, suspension means data, manufacturer's name, and the date of installation. It shall be fastened in a conspicuous place in the machine area.

[Statutory Authority: RCW 70.87.080, 70.87.090 and 70.87.100. 86-03-032 (Order 86-11), § 296-94-140, filed 1/10/86.]

**WAC 296-94-150 Guide and track supports and fastenings.** (1) Material. Guide rails, guide rail brackets, splice plates, and their fastenings shall be of steel or other metals conforming to the requirements of this section.

(2) Stresses and deflections. The guide rail brackets, their fastenings and supports, shall be capable of resisting the horizontal forces imposed by loading with a total deflection at the point of support not in excess of one-eighth inch. The guide rails shall not deflect in any direction more than one-fourth inch measured at the mid-point between brackets.

[Title 296 WAC—p 1762]

(3) Overall length of guide rails or tracks. The top and bottom ends of each run of guide rail shall be so located in relation to the extreme positions of travel of the car and counterweight that the car and counterweight guiding members cannot travel beyond the ends of the guide rails.

[Statutory Authority: RCW 70.87.080, 70.87.090 and 70.87.100. 86-03-032 (Order 86-11), § 296-94-150, filed 1/10/86.]

**WAC 296-94-160 Counterweight guiding and construction.** (1) Guiding. Counterweights, where used, shall be in a guide or track.

(2) Construction. Counterweights shall not be of sufficient weight to cause undue slackening of any car hoisting rope or chain during acceleration or retardation of the car. Counterweight weight section shall be mounted in structural or formed metal frames so designed as to retain weights securely in place.

EXCEPTION: Counterweights may be constructed of a single metal plate.

[Statutory Authority: RCW 70.87.080, 70.87.090 and 70.87.100. 86-03-032 (Order 86-11), § 296-94-160, filed 1/10/86.]

**WAC 296-94-170 Car safeties and governors.** (1) Where required. All inclined lifts shall be provided with a safety capable of stopping and sustaining the car with rated load.

(2) Operation of car safeties. The car safety shall be of the Type A or B and operated by a speed governor. The governor shall operate to set the safety at a maximum speed of one hundred forty percent of rated speed and on breakage of the hoisting ropes, the safety shall operate without appreciable delay and independently of the governor speed action.

(3) Location of speed governor. Where a speed governor is used, it shall be located where it cannot be struck by the car or counterweight in case of overtravel and where there is sufficient space for full movement of the governor parts and where it is accessible for examination.

(4) Opening of brake and motor control circuits on safety application. The motor-control circuit and the brake-control circuit shall be opened before or at the time the safety applies.

(5) Governor ropes. The governor ropes, where used, shall be of iron, steel, monel metal, or phosphor bronze not less than one-quarter inch in diameter. Tiller-rope construction shall not be used.

(6) Slack-rope and slack-chain devices for winding-drum and roller-chain type driving machines. Inclined lifts of the winding-drum type with rope suspension shall be provided with a slack-rope device of the manually reset type which will remove the power from the motor and brake if the car is obstructed in its descent and the hoisting ropes slacken.

Inclined lifts with roller-chain suspension shall be provided with a slack-chain device which will remove the power from the motor and brake if the car is obstructed in its descent and the hoisting chains slacken. This device need not be of the manually reset type if the

chain sprockets are guarded to prevent the chain from jumping off the sprockets.

(7) Application of car safety. A car safety device which depends upon the completion or maintenance of an electric circuit for the application of the safety shall not be used. Car safeties shall be applied mechanically.

(8) Use of cast iron in car safeties. Cast iron shall not be used in the construction of any part of a car safety the breakage of which would result in failure of the safety to function to stop and sustain the car.

(9) Car safety tests. A test of the car safety shall be made with rated load in the car before the inclined lift is put into service. Governor operation of instantaneous-type safeties shall be tested at rated speed by tripping the governor by hand. Where speed governors are located on the car or chassis, testing shall be performed by obtaining sufficient slack rope and dropping the car.

[Statutory Authority: RCW 70.87.080, 70.87.090 and 70.87.100. 86-03-032 (Order 86-11), § 296-94-170, filed 1/10/86.]

#### WAC 296-94-180 Driving machines and sheaves.

(1) Materials for drums and sheaves and minimum diameter. Winding drums, traction sheaves, and overhead and deflecting sheaves shall be of cast iron or steel, of a diameter of not less than thirty times the diameter of the wire hoisting ropes. The rope grooves shall be machined.

EXCEPTION: Where 8 x 19 steel ropes are used, the diameter of drums and sheaves may be reduced to twenty-one times the diameter of the rope.

(2) Factor of safety. The factor of safety, based on the static load (the rated load plus the weight of the car, ropes, counterweights, etc.) to be used in the design of driving machines and sheaves shall be not less than:

- (a) Eight for wrought iron and steel;
- (b) Ten for cast iron, cast steel, and other material.

(3) Set-screw fastenings. Set-screw fastenings shall not be used in lieu of keys or pins if the connection is subject to torque or tension.

(4) Friction gear, clutch mechanism, or coupling. Friction gear, clutch mechanism, or coupling shall not be used for connecting the drum or sheaves to the main driving gear.

(5) Use of cast iron in gears. Worm gearing having cast iron teeth shall not be used.

(6) Driving machine brakes. Driving machines shall be equipped with electrically released spring-applied brakes.

(7) Operation of brake. A single ground or short circuit, a counter-voltage, or a motor field discharge shall not prevent the brake magnet from allowing the brake to set when the operating device is placed in the stop position.

(8) Location of driving machine, alignment, and guarding of sheaves. The driving machine may be mounted on the car chassis or placed at a remote location. If remotely located, all intervening sheaves or sprockets shall be placed to ensure rope or chain travels in proper alignment. All sheaves or sprockets shall be guarded.

(9) Driving-machine roller-chain sprockets. Driving-machine roller-chain sprockets shall be steel and shall

conform in all particulars of design and dimensions to ANSI B29.1-1963, Transmission Roller Chains and Sprocket Teeth.

(10) Screw machines. Screw machines shall not be used.

(11) Hydraulic driving machines. Hydraulic driving machines, where used, shall conform to ANSI A17.1. Roped hydraulic machines may be used.

[Statutory Authority: RCW 70.87.080, 70.87.090 and 70.87.100. 86-03-032 (Order 86-11), § 296-94-180, filed 1/10/86.]

#### WAC 296-94-190 Terminal stopping switches. (1)

Terminal stopping switches. Upper and lower normal terminal stopping switches, operated by the chassis, shall be provided and set to stop the chassis at normal top and bottom terminals of travel.

(2) Final stopping switches. Final terminal stopping switches, operated by the chassis, shall be provided and set to stop the chassis should it overtravel the normal terminals.

(3) Slack cable switches. On winding drum machines, a slack cable switch may be used in lieu of a bottom final terminal switch.

(4) Operation of stopping devices. The final terminal stopping device shall act to prevent the movement of the chassis in both directions of travel. The normal and final terminal stopping devices shall not control the same switches on the controller unless two or more separate and independent switches are provided, two of which shall be closed to complete the motor and brake circuits in each direction of travel.

[Statutory Authority: RCW 70.87.080, 70.87.090 and 70.87.100. 86-03-032 (Order 86-11), § 296-94-190, filed 1/10/86.]

#### WAC 296-94-200 Operation. (1) Type of operation.

The incline lift shall be operated by constant pressure or momentary pressure key switches at each landing and on the car. Key-operated switches shall be of the spring return type and shall be operated by a cylinder type lock having not less than five pin or five disc combination with the key removable only when the switch is in the off position and shall be weatherproof.

(2) Emergency stop switches in cars. An emergency stop switch shall be provided on or adjacent to the car operating panel. Stop switches shall be of the manually opened and manually closed type with red handles or buttons and conspicuously marked "STOP." Where springs are used, their failure shall not prevent opening of the switch.

(3) Control and operating circuit requirements. The design and installation of the control and operating circuits shall conform to the following:

(a) Control systems which depend on the completion or maintenance of an electric circuit shall not be used for:

(i) Interruption of the power and application of the machine brake at the terminals;

(ii) Stopping of the car when the emergency stop switch in the car is opened or any of the electrical protective devices operate;

(iii) Stopping the machine when the safety applies.

(b) If springs are used to actuate switches, contactors, or relays to break the circuit to stop an elevator at the terminal, they shall be of the restrained compression type.

(4) Hand rope operation. Hand rope operation shall not be used.

[Statutory Authority: RCW 70.87.080, 70.87.090 and 70.87.100. 86-03-032 (Order 86-11), § 296-94-200, filed 1/10/86.]

**WAC 296-94-210 Suspension means.** (1) Types permitted. Where the chassis is suspended from the driving machine by a wire rope or roller chain, a single suspension means may be used. The suspension means shall be any one of the following:

- (a) Steel elevator wire rope;
- (b) Steel aircraft cable;
- (c) Roller chain conforming to ANSI transmission roller chains and sprocket teeth.

(2) Types prohibited. Steel tapes shall not be used as suspension means.

(3) Minimum diameter of suspension means. The diameter of hoist rope(s) or cable(s) shall not be less than the following:

- (a) One-quarter inch for elevator wire rope;
- (b) Three-sixteenth inch for galvanized aircraft cable.

(4) Factor of safety of suspension means. The suspension means shall have a factor of safety of not less than eight based on the tension on the rope(s) or chain(s) when raising the carriage and its rated load. In no case shall the rated breaking strength of the rope(s) or chain(s) be less than four thousand pounds.

(5) Arc of contact of suspension means on sheaves and sprockets. The arc of contact of a wire rope on a traction sheave shall be sufficient to produce adequate traction under all load conditions. The arc of contact of a chain with a driving sprocket shall be not less than one hundred forty degrees.

(6) Idle turns of ropes on winding drums. All wire ropes anchored to a winding drum shall have not less than one full turn of rope on the drum when the car or counterweight has reached its limit of possible overtravel.

(7) Lengthening, splicing, repairing, or replacing suspension means. No car or counterweight wire rope shall be lengthened or repaired by splicing broken or worn suspension chains shall not be repaired. If one wire rope or a chain of a set is worn or damaged and requires replacement, the entire set of ropes or chains shall be replaced. In the event that a worn chain is replaced, the drive sprocket shall also be replaced.

(8) Securing ends of suspension ropes in winding drums. The winding-drum ends of car and counterweight wire ropes shall be secured by clamps on the inside of the drum or by one of the methods specified in subsection (9) of this section for fastening wire ropes to car or counterweight.

(9) Fastening of rope suspension means to cars and counterweights. The car or counterweight ends of wire ropes shall be fastened by return loop, by properly made

individual tapered babbitted sockets or by properly attached fittings as recommended by wire rope manufacturers. Clamps of the U-bolt type shall not be used.

Tapered babbitted rope sockets and the method of babbitting shall conform to the requirements of ANSI A17.1. The diameter of the hole in the small end of the socket shall not exceed the nominal diameter of the rope by more than three thirty-seconds of an inch.

[Statutory Authority: RCW 70.87.080, 70.87.090 and 70.87.100. 86-03-032 (Order 86-11), § 296-94-210, filed 1/10/86.]

**WAC 296-94-220 Traveling cable(s).** All traveling cable(s) shall be Type SO or ETT and shall conform to the requirements of the National Electrical Code ANSI CI-1975. Where circuits through the traveling cable(s) exceed thirty volts, a means will be provided to remove the power automatically upon parting of the traveling cable.

[Statutory Authority: RCW 70.87.080, 70.87.090 and 70.87.100. 86-03-032 (Order 86-11), § 296-94-220, filed 1/10/86.]

**WAC 296-94-230 Electric wiring.** (1) Wiring requirements. All wiring shall conform to the requirements of the National Electrical Code.

(2) Electrical connections. If the driving machine is mounted on the car chassis, electrical connections between the car and power source is to be provided with a means to remove power should connecting traveling cable part. All electrical connections to the moving chassis and the stationary connections shall be insulated flexible conductors, in accordance with the National Electrical Code article six hundred and twenty on elevators.

[Statutory Authority: RCW 70.87.080, 70.87.090 and 70.87.100. 86-03-032 (Order 86-11), § 296-94-230, filed 1/10/86.]

**WAC 296-94-240 Track(s)/guide(s) supporting structure.** All supporting structures shall meet the local building codes.

[Statutory Authority: RCW 70.87.080, 70.87.090 and 70.87.100. 86-03-032 (Order 86-11), § 296-94-240, filed 1/10/86.]

**WAC 296-94-250 Means of egress.** (1) Hand crank. A hand crank capable of moving the car in accordance with ANSI A17.1 shall be provided.

(2) Brake release. The machine brake shall be provided with a lever to release the brake allowing use of the hand crank.

[Statutory Authority: RCW 70.87.080, 70.87.090 and 70.87.100. 86-03-032 (Order 86-11), § 296-94-250, filed 1/10/86.]

## Chapter 296-99 WAC

### SAFETY STANDARDS FOR GRAIN HANDLING FACILITIES

WAC	
296-99-010	Scope.
296-99-015	Application.
296-99-020	Definitions.
296-99-025	Emergency action plan.
296-99-030	Training.
296-99-035	Hot work permit.

296-99-040	Entry into bins, silos, and tanks.
296-99-045	Contractors.
296-99-050	Housekeeping.
296-99-055	Grate openings.
296-99-060	Filter collectors.
296-99-065	Preventive maintenance.
296-99-070	Grain stream processing equipment.
296-99-075	Emergency escape.
296-99-080	Continuous-flow bulk raw grain dryers.
296-99-085	Inside bucket elevators.
296-99-090	Appendix A, grain handling facilities.
296-99-093	Appendix B, grain handling facilities.
296-99-095	Appendix C, grain handling facilities.

**WAC 296-99-010 Scope.** This section contains requirements for the control of grain dust fires and explosions, and certain other safety hazards associated with grain handling facilities. It applies in addition to all other relevant provisions of chapters 296-24 and 296-62 WAC (or chapter 296-56 WAC at marine terminals).

[Statutory Authority: Chapter 49.17 RCW. 88-23-054 (Order 88-25), § 296-99-010, filed 11/14/88.]

**WAC 296-99-015 Application.** (1) WAC 296-99-010 through 296-99-070 apply to grain elevators, feed mills, flour mills, rice mills, dust pelletizing plants, dry corn mills, soybean flaking operations, and the dry grinding operations of soycake.

(2) WAC 296-99-075, 296-99-080, and 296-99-085 apply only to grain elevators.

[Statutory Authority: Chapter 49.17 RCW. 88-23-054 (Order 88-25), § 296-99-015, filed 11/14/88.]

**WAC 296-99-020 Definitions.** (1) "Choked leg" means a condition of material buildup in the bucket elevator that results in the stoppage of material flow and bucket movement. A bucket elevator is not considered choked that has the up-leg partially or fully loaded and has the boot and discharge cleared allowing bucket movement.

(2) "Fugitive grain dust" means combustible dust particles, emitted from the stock handling system, of such size as will pass through a U.S. Standard 40 mesh sieve (425 microns or less).

(3) "Grain elevator" means a facility engaged in the receipt, handling, storage, and shipment of bulk raw agricultural commodities such as corn, wheat, oats, barley, sunflower seeds, and soybeans.

(4) "Hot work" means work involving electric or gas welding, cutting, brazing, or similar flame producing operations.

(5) "Inside bucket elevator" means a bucket elevator that has the boot and more than twenty percent of the total leg height (above grade or ground level) inside the grain elevator structure. Bucket elevators with leg casings that are inside (and pass through the roofs) of rail or truck dump sheds with the remainder of the leg outside of the grain elevator structure, are not considered inside bucket elevators.

(6) "Jogging" means repeated starting and stopping of drive motors in an attempt to clear choked legs.

(7) "Lagging" means a covering on drive pulleys used to increase the coefficient of friction between the pulley and the belt.

(1989 Ed.)

(8) "Permit" means the written certification by the employer authorizing employees to perform identified work operations subject to specified precautions.

[Statutory Authority: Chapter 49.17 RCW. 88-23-054 (Order 88-25), § 296-99-020, filed 11/14/88.]

**WAC 296-99-025 Emergency action plan.** The employer shall develop and implement an emergency action plan meeting the requirements contained in WAC 296-24-567.

[Statutory Authority: Chapter 49.17 RCW. 88-23-054 (Order 88-25), § 296-99-025, filed 11/14/88.]

**WAC 296-99-030 Training.** (1) The employer shall provide training to employees at least annually and when changes in job assignment will expose them to new hazards. Current employees, and new employees prior to starting work, shall be trained in at least the following:

(a) General safety precautions associated with the facility, including recognition and preventive measures for the hazards related to dust accumulations and common ignition sources such as smoking; and

(b) Specific procedures and safety practices applicable to their job tasks including but not limited to, cleaning procedures for grinding equipment, clearing procedures for choked legs, housekeeping procedures, hot work procedures, preventive maintenance procedures, and lock-out/tag-out procedures.

(2) Employees assigned special tasks, such as bin entry and handling of flammable or toxic substances, shall be provided training to perform these tasks safely.

[Statutory Authority: Chapter 49.17 RCW. 88-23-054 (Order 88-25), § 296-99-030, filed 11/14/88.]

**WAC 296-99-035 Hot work permit.** (1) The employer shall issue a permit for all hot work, with the following exceptions:

(a) Where the employer or the employer's representative (who would otherwise authorize the permit) is present while the hot work is being performed;

(b) In welding shops authorized by the employer;

(c) In hot work areas authorized by the employer which are located outside of the grain handling structure.

(2) The permit shall certify that the requirements contained in WAC 296-24-695 have been implemented prior to beginning the hot work operations. The permit shall be kept on file until completion of the hot work operations.

[Statutory Authority: Chapter 49.17 RCW. 88-23-054 (Order 88-25), § 296-99-035, filed 11/14/88.]

**WAC 296-99-040 Entry into bins, silos, and tanks.** This paragraph applies to employees entering bins, silos, or tanks. It does not apply to employees entering flat storage buildings or tanks where the diameter of such structures is greater than the height, unless entry is made from the top of the structure.

The following actions shall be taken before employees enter bins, silos, or tanks:

[Title 296 WAC—p 1765]

(1) The employer shall issue a permit for entering bins, silos, or tanks unless the employer or the employer's representative (who would otherwise authorize the permit) is present during the entire operation. The permit shall certify that the precautions contained in this section have been implemented prior to employees entering bins, silos, or tanks. The permit shall be kept on file until completion of the entry operations.

(2) All mechanical, electrical, hydraulic, and pneumatic equipment which present a danger to employees inside bins, silos, or tanks shall be disconnected, locked-out and tagged, blocked-off, or prevented from operating by other means or methods.

(3) The atmosphere within a bin, silo, or tank shall be tested for the presence of combustible gases, vapors, and toxic agents when the employer has reason to believe they may be present. Additionally, the atmosphere within a bin, silo, or tank shall be tested for oxygen content unless there is continuous natural air movement or continuous forced-air ventilation before and during the period employees are inside. If the oxygen level is less than nineteen and one-half percent, or if combustible gas or vapor is detected in excess of ten percent of the lower flammable limit, or if toxic agents are present in excess of the ceiling values listed in WAC 296-62-07515, or if toxic agents are present in concentrations that will cause health effects which prevent employees from effecting self-rescue or communication to obtain assistance, the following provisions apply.

(a) Ventilation shall be provided until the unsafe condition or conditions are eliminated, and the ventilation shall be continued as long as there is a possibility of recurrence of the unsafe condition while the bin, silo, or tank is occupied by employees.

(b) If toxicity or oxygen deficiency cannot be eliminated by ventilation, employees entering the bin, silo, or tank shall wear an appropriate respirator. Respirator use shall be in accordance with the requirements of WAC 296-62-071 through 296-62-07121.

(4) When entering bins, silos, or tanks from the top, employees shall wear a body harness with lifeline, or use a boatswain's chair that meets the requirements of Part J-1 of chapter 296-24 WAC.

(5) An observer, equipped to provide assistance, shall be stationed outside the bin, silo, or tank being entered by an employee. Communications (visual, voice, or signal line) shall be maintained between the observer and employee entering the bin, silo, or tank.

(6) The employer shall provide equipment for rescue operations which is specifically suited for the bin, silo, or tank being entered.

(7) The employee acting as observer shall be trained in rescue procedures, including notification methods for obtaining additional assistance.

(8) Employees shall not enter bins, silos, or tanks underneath a bridging condition, or where a buildup of grain products on the sides could fall and bury them.

[Statutory Authority: Chapter 49.17 RCW. 88-23-054 (Order 88-25), § 296-99-040, filed 11/14/88.]

[Title 296 WAC—p 1766]

**WAC 296-99-045 Contractors.** (1) The employer shall inform contractors performing work at the grain handling facility of known potential fire and explosion hazards related to the contractor's work and work area. The employer shall also inform contractors of the applicable safety rules of the facility.

(2) The employer shall explain the applicable provisions of the emergency action plan to contractors.

[Statutory Authority: Chapter 49.17 RCW. 88-23-054 (Order 88-25), § 296-99-045, filed 11/14/88.]

**WAC 296-99-050 Housekeeping.** (1) The employer shall develop and implement a written housekeeping program that establishes the frequency and method(s) determined best to reduce accumulations of fugitive grain dust on ledges, floors, equipment, and other exposed surfaces.

(2) In addition, the housekeeping program for grain elevators shall address fugitive grain dust accumulations at priority housekeeping areas.

(a) Priority housekeeping areas shall include at least the following:

(i) Floor areas within thirty-five feet (10.7 m) of inside bucket elevators;

(ii) Floors of enclosed areas containing grinding equipment;

(iii) Floors of enclosed areas containing grain dryers located inside the facility.

(b) The employer shall immediately remove any fugitive grain dust accumulations whenever they exceed one-eighth inch (.32 cm) at priority housekeeping areas, pursuant to the housekeeping program, or shall demonstrate and assure, through the development and implementation of the housekeeping program, that equivalent protection is provided.

(3) The use of compressed air to blow dust from ledges, walls, and other areas shall only be permitted when all machinery that presents an ignition source in the area is shut-down, and all other known potential ignition sources in the area are removed or controlled.

(4) Grain and product spills shall not be considered fugitive grain dust accumulations. However, the housekeeping program shall address the procedures for removing such spills from the work area.

[Statutory Authority: Chapter 49.17 RCW. 88-23-054 (Order 88-25), § 296-99-050, filed 11/14/88.]

**WAC 296-99-055 Grate openings.** (1) Receiving-pit feed openings, such as truck or railcar receiving-pits, shall be covered by grates.

(2) The width of openings in the grates shall be a maximum of two and one-half inches (6.35 cm).

[Statutory Authority: Chapter 49.17 RCW. 88-23-054 (Order 88-25), § 296-99-055, filed 11/14/88.]

**WAC 296-99-060 Filter collectors.** (1) Not later than March 30, 1989, all fabric dust filter collectors which are a part of a pneumatic dust collection system shall be equipped with a monitoring device that will indicate a pressure drop across the surface of the filter.

(1989 Ed.)

(2) Filter collectors installed after March 30, 1988, shall be:

- (a) Located outside the facility; or
- (b) Located in an area inside the facility protected by an explosion suppression system; or
- (c) Located in an area inside the facility that is separated from other areas of the facility by construction having at least a one hour fire-resistance rating, and which is adjacent to an exterior wall and vented to the outside. The vent and ductwork shall be designed to resist rupture due to deflagration.

[Statutory Authority: Chapter 49.17 RCW. 88-23-054 (Order 88-25), § 296-99-060, filed 11/14/88.]

**WAC 296-99-065 Preventive maintenance.** (1) The employer shall implement preventive maintenance procedures consisting of:

(a) Regularly scheduled inspections of at least the mechanical and safety control equipment associated with dryers, grain stream processing equipment, dust collection equipment including filter collectors, and bucket elevators;

(b) Lubrication and other appropriate maintenance in accordance with manufacturers' recommendations, or as determined necessary by prior operating records.

(2) The employer shall promptly correct dust collection systems which are malfunctioning or which are operating below designed efficiency. Additionally, the employer shall promptly correct, or remove from service, overheated bearings and slipping or misaligned belts associated with inside bucket elevators.

(3) A certification record shall be maintained of each inspection, performed in accordance with this section, containing the date of the inspection, the name of the person who performed the inspection and the serial number, or other identifier, of the equipment specified in subsection (1)(a) of this section that was inspected.

(4) The employer shall implement procedures for the use of tags and locks which will prevent the inadvertent application of energy or motion to equipment being repaired, serviced, or adjusted, which could result in employee injury. Such locks and tags shall be removed in accordance with established procedures only by the employee installing them or, if unavailable, by his or her supervisor.

[Statutory Authority: Chapter 49.17 RCW. 88-23-054 (Order 88-25), § 296-99-065, filed 11/14/88.]

**WAC 296-99-070 Grain stream processing equipment.** The employer shall equip grain stream processing equipment (such as hammer mills, grinders, and pulverizers) with an effective means of removing ferrous material from the incoming grain stream.

[Statutory Authority: Chapter 49.17 RCW. 88-23-054 (Order 88-25), § 296-99-070, filed 11/14/88.]

**WAC 296-99-075 Emergency escape.** (1) The employer shall provide at least two means of emergency escape from galleries (bin decks).

(2) The employer shall provide at least one means of emergency escape in tunnels of existing grain elevators.

Tunnels in grain elevators constructed after the effective date of this standard shall be provided with at least two means of emergency escape.

[Statutory Authority: Chapter 49.17 RCW. 88-23-054 (Order 88-25), § 296-99-075, filed 11/14/88.]

**WAC 296-99-080 Continuous-flow bulk raw grain dryers.** (1) Not later than April 1, 1991, all direct-heat grain dryers shall be equipped with automatic controls that:

(a) Will shut-off the fuel supply in case of power or flame failure or interruption of air movement through the exhaust fan; and

(b) Will stop the grain from being fed into the dryer if excessive temperature occurs in the exhaust of the drying section.

(2) Direct-heat grain dryers installed after March 30, 1988, shall be:

(a) Located outside the grain elevator; or

(b) Located in an area inside the grain elevator protected by a fire or explosion suppression system; or

(c) Located in an area inside the grain elevator which is separated from other areas of the facility by construction having at least a one hour fire-resistance rating.

[Statutory Authority: Chapter 49.17 RCW. 88-23-054 (Order 88-25), § 296-99-080, filed 11/14/88.]

**WAC 296-99-085 Inside bucket elevators.** (1) Bucket elevators shall not be jugged to free a choked leg.

(2) All belts and lagging purchased after March 30, 1988, shall be conductive. Such belts shall have a surface electrical resistance not to exceed 300 megohms.

(3) Not later than April 1, 1991, all bucket elevators shall be equipped with a means of access to the head pulley section to allow inspection of the head pulley, lagging, belt, and discharge throat of the elevator head. The boot section shall also be provided with a means of access for clean-out of the boot and for inspection of the boot, pulley, and belt.

(4) Not later than April 1, 1991, the employer shall:

(a) Mount bearings externally to the leg casing; or

(b) Provide vibration monitoring, temperature monitoring, or other means to monitor the condition of those bearings mounted inside or partially-inside the leg casing.

(5) Not later than April 1, 1991, the employer shall equip bucket elevators with a motion detection device which will shut-down the bucket elevator when the belt speed is reduced by no more than twenty percent of the normal operating speed.

(6) Not later than April 1, 1991, the employer shall:

(a) Equip bucket elevators with a belt alignment monitoring device which will initiate an alarm to employees when the belt is not tracking properly; or

(b) Provide a means to keep the belt tracking properly, such as a system that provides constant alignment adjustment of belts.

(7) Subsections (5) and (6) of this section do not apply to grain elevators having a permanent storage capacity of less than one million bushels, provided that



daily visual inspection is made of bucket movement and tracking of the belt.

(8) Subsections (4), (5), and (6) of this section do not apply to the following:

(a) Bucket elevators which are equipped with an operational fire and explosion suppression system capable of protecting at least the head and boot section of the bucket elevator; or

(b) Bucket elevators which are equipped with pneumatic or other dust control systems or methods that keep the dust concentration inside the bucket elevator at least twenty-five percent below the lower explosive limit at all times during operations.

Note: The following appendices to this chapter serve as nonmandatory guidelines to assist employers and employees in complying with the requirements of this section, as well as to provide other helpful information.

No additional burdens are imposed through these appendices.

[Statutory Authority: Chapter 49.17 RCW. 88-23-054 (Order 88-25), § 296-99-085, filed 11/14/88.]

**WAC 296-99-090 Appendix A, grain handling facilities.**

Note: Examples presented in this appendix may not be the only means of achieving the performance goals in the standard.

(1) Scope and application. The provisions of this standard apply in addition to any other applicable requirements of chapters 296-24 and 296-62 WAC (or chapter 296-56 WAC at marine terminals). The standard contains requirements for new and existing grain handling facilities. The standard does not apply to seed plants which handle and prepare seeds for planting of future crops, nor to on-farm storage or feed lots.

(2) Emergency action plan.

(a) The standard requires the employer to develop and implement an emergency action plan. The emergency action plan WAC 296-24-567 covers those designated actions employers and employees are to take to ensure employee safety from fire and other emergencies. The plan specifies certain minimum elements which are to be addressed. These elements include the establishment of an employee alarm system, the development of evacuation procedures, and training employees in those actions they are to take during an emergency.

(b) The standard does not specify a particular method for notifying employees of an emergency. Public announcement systems, air horns, steam whistles, a standard fire alarm system, or other types of employee alarm may be used. However, employers should be aware that employees in a grain facility may have difficulty hearing an emergency alarm, or distinguishing an emergency alarm from other audible signals at the facility, or both. Therefore, it is important that the type of employee alarm used be distinguishable and distinct.

(c) The use of floor plans or workplace maps which clearly show the emergency escape routes should be included in the emergency action plan; color coding will aid employees in determining their route assignments. The employer should designate a safe area, outside the

facility, where employees can congregate after evacuation, and implement procedures to account for all employees after emergency evacuation has been completed.

(d) It is also recommended that employers seek the assistance of the local fire department for the purpose of preplanning for emergencies. Preplanning is encouraged to facilitate coordination and cooperation between facility personnel and those who may be called upon for assistance during an emergency. It is important for emergency service units to be aware of the usual work locations of employees at the facility.

(3) Training.

(a) It is important that employees be trained in the recognition and prevention of hazards associated with grain facilities, especially those hazards associated with their own work tasks. Employees should understand the factors which are necessary to produce a fire or explosion, i.e., fuel (such as grain dust), oxygen, ignition source, and (in the case of explosions) confinement. Employees should be made aware that any efforts they make to keep these factors from occurring simultaneously will be an important step in reducing the potential for fires and explosions.

(b) The standard provides flexibility for the employer to design a training program which fulfills the needs of a facility. The type, amount, and frequency of training will need to reflect the tasks that employees are expected to perform. Although training is to be provided to employees at least annually, it is recommended that safety meetings or discussions and drills be conducted at more frequent intervals.

(c) The training program should include those topics applicable to the particular facility, as well as topics such as: Hot work procedures; lock-out/tag-out procedures; bin entry procedures; bin cleaning procedures; grain dust explosions; fire prevention; procedures for handling "hot grain"; housekeeping procedures, including methods and frequency of dust removal; pesticide and fumigant usage; proper use and maintenance of personal protective equipment; and, preventive maintenance. The types of work clothing should also be considered in the program at least to caution against using polyester clothing that easily melts and increases the severity of burns, as compared to wool or fire retardant cotton.

(d) In implementing the training program, it is recommended that the employer utilize films, slide-tape presentations, pamphlets, and other information which can be obtained from such sources as the Grain Elevator and Processing Society, the Cooperative Extension Service of the United States Department of Agriculture, Kansas State University's Extension Grain Science and Industry, and other state agriculture schools, industry associations, union organizations, and insurance groups.

(4) Hot work permit.

(a) The implementation of a permit system for hot work is intended to assure that employers maintain control over operations involving hot work and to assure that employees are aware of and utilize appropriate safeguards when conducting these activities.



(b) Precautions for hot work operations are specified in WAC 296-24-695, and include such safeguards as relocating the hot work operation to a safe location if possible, relocating or covering combustible material in the vicinity, providing fire extinguishers, and provisions for establishing a fire watch. Permits are not required for hot work operations conducted in the presence of the employer or the employer's authorized representative who would otherwise issue the permit, or in an employer authorized welding shop or when work is conducted outside and away from the facility.

(c) It should be noted that the permit is not a record, but is an authorization of the employer certifying that certain safety precautions have been implemented prior to the beginning of work operations.

(5) Entry into bins, silos, and tanks.

(a) In order to assure that employers maintain control over employee entry into bins, silos, and tanks, WISHA is requiring that the employer issue a permit for entry into bins, silos, and tanks unless the employer (or the employer's representative who would otherwise authorize the permit) is present at the entry and during the entire operation.

(b) Employees should have a thorough understanding of the hazards associated with entry into bins, silos, and tanks. Employees are not to be permitted to enter these spaces from the bottom when grain or other agricultural products are hung up or sticking to the sides which might fall and injure or kill an employee. Employees should be made aware that the atmosphere in bins, silos, and tanks can be oxygen deficient or toxic. Employees should be trained in the proper methods of testing the atmosphere, as well as in the appropriate procedures to be taken if the atmosphere is found to be oxygen deficient or toxic. When a fumigant has been recently applied in these areas and entry must be made, aeration fans should be running continuously to assure a safe atmosphere for those inside. Periodic monitoring of toxic levels should be done by direct reading instruments to measure the levels, and, if there is an increase in these readings, appropriate actions should be promptly taken.

(c) Employees have been buried and suffocated in grain or other agricultural products because they sank into the material. Therefore, it is suggested that employees not be permitted to walk or stand on the grain or other grain product where the depth is greater than waist high. In this regard, employees must use a full body harness or boatswain's chair with a lifeline when entering from the top. A winch system with mechanical advantage (either powered or manual) would allow better control of the employee than just using a hand held hoist line, and such a system would allow the observer to remove the employee easily without having to enter the space.

(d) It is important that employees be trained in the proper selection and use of any personal protective equipment which is to be worn. Equally important is the training of employees in the planned emergency rescue procedures. Employers should carefully read WAC 296-62-07115 and assure that their procedures follow these requirements. The employee acting as observer is to be

equipped to provide assistance and is to know procedures for obtaining additional assistance. The observer should not enter a space until adequate assistance is available. It is recommended that an employee trained in CPR be readily available to provide assistance to those employees entering bins, silos, or tanks.

(6) Contractors.

(a) These provisions of the standard are intended to ensure that outside contractors are cognizant of the hazards associated with grain handling facilities, particularly in relation to the work they are to perform for the employer. Also, in the event of an emergency, contractors should be able to take appropriate action as a part of the overall facility emergency action plan. Contractors should also be aware of the employer's permit systems. Contractors should develop specified procedures for performing hot work and for entry into bins, silos, and tanks and these activities should be coordinated with the employer. Contractors are responsible for informing their own employees.

(b) This coordination will help to ensure that employers know what work is being performed at the facility by contractors; where it is being performed; and, that it is being performed in a manner that will not endanger employees.

(7) Housekeeping.

(a) The housekeeping program is to be designed to keep dust accumulations and emissions under control inside grain facilities. The housekeeping program, which is to be written, is to specify the frequency and method(s) used to best reduce dust accumulations.

(b) Ship, barge, and rail loadout and receiving areas which are located outside the facility need not be addressed in the housekeeping program. Additionally, truck dumps which are open on two or more sides need not be addressed by the housekeeping program. Other truck dumps should be addressed in the housekeeping program to provide for regular cleaning during periods of receiving grain or agricultural products. The housekeeping program should provide coverage for all workspaces in the facility and include walls, beams, etc., especially in relation to the extent that dust could accumulate.

(i) Dust accumulations.

(A) Almost all facilities will require some level of manual housekeeping. Manual housekeeping methods, such as vacuuming or sweeping with soft bristle brooms, should be used which will minimize the possibility of layered dust being suspended in the air when it is being removed.

(B) The housekeeping program should include a contingency plan to respond to situations where dust accumulates rapidly due to a failure of a dust enclosure hood, an unexpected breakdown of the dust control system, a dust-tight connection inadvertently knocked open, etc.

(C) The housekeeping program should also specify the manner of handling spills. Grain spills are not considered to be dust accumulations.

(D) A fully enclosed horizontal belt conveying system where the return belt is inside the enclosure should have

inspection access such as sliding panels or doors to permit checking of equipment, checking for dust accumulations and facilitate cleaning if needed.

(ii) Dust emissions.

(A) Employers should analyze the entire stock handling system to determine the location of dust emissions and effective methods to control or to eliminate them. The employer should make sure that holes in spouting, casings of bucket elevators, pneumatic conveying pipes, screw augers, or drag conveyor casings, are patched or otherwise properly repaired to prevent leakage. Minimizing free falls of grain or grain products by using choke feeding techniques, and utilization of dust-tight enclosures at transfer points, can be effective in reducing dust emissions.

(B) Each housekeeping program should specify the schedules and control measures which will be used to control dust emitted from the stock handling system. The housekeeping program should address the schedules to be used for cleaning dust accumulations from motors, critical bearings and other potential ignition sources in the working areas. Also, the areas around bucket elevator legs, milling machinery and similar equipment should be given priority in the cleaning schedule. The method of disposal of the dust which is swept or vacuumed should also be planned.

(C) Dust may accumulate in somewhat inaccessible areas, such as those areas where ladders or scaffolds might be necessary to reach them. The employer may want to consider the use of compressed air and long lances to blow down these areas frequently. The employer may also want to consider the periodic use of water and hoses to wash down these areas. If these methods are used, they are to be specified in the housekeeping program along with the appropriate safety precautions, including the use of personal protective equipment such as eyewear and dust respirators.

(D) Several methods have been effective in controlling dust emissions. A frequently used method of controlling dust emissions is a pneumatic dust collection system. However, the installation of a poorly designed pneumatic dust collection system has fostered a false sense of security and has often led to an inappropriate reduction in manual housekeeping. Therefore, it is imperative that the system be designed properly and installed by a competent contractor. Those employers who have a pneumatic dust control system that is not working according to expectations should request the engineering design firm, or the manufacturer of the filter and related equipment, to conduct an evaluation of the system to determine the corrections necessary for proper operation of the system. If the design firm or manufacturer of the equipment is not known, employers should contact their trade association for recommendations of competent designers of pneumatic dust control systems who could provide assistance.

(E) When installing a new or upgraded pneumatic control system, the employer should insist on an acceptance test period of thirty to forty-five days of operation to ensure that the system is operating as intended and designed. The employer should also obtain maintenance,

testing, and inspection information from the manufacturer to ensure that the system will continue to operate as designed.

(F) Aspiration of the leg, as part of a pneumatic dust collection system, is another effective method of controlling dust emissions. Aspiration of the leg consists of a flow of air across the entire boot, which entrains the liberated dust and carries it up the up-leg to take-off points. With proper aspiration, dust concentrations in the leg can be lowered below the lower explosive limit. Where a prototype leg installation has been instrumented and shown to be effective in keeping the dust level twenty-five percent below the lower explosive limit during normal operations for the various products handled, then other legs of similar size, capacity and products being handled which have the same design criteria for the air aspiration would be acceptable to OSHA, provided the prototype test report is available on site.

(G) Another method of controlling dust emissions is enclosing the conveying system, pressurizing the general work area, and providing a lower pressure inside the enclosed conveying system. Although this method is effective in controlling dust emissions from the conveying system, adequate access to the inside of the enclosure is necessary to facilitate frequent removal of dust accumulations. This is also necessary for those systems called "self-cleaning."

(H) The use of edible oil sprayed on or into a moving stream of grain is another method which has been used to control dust emissions. Tests performed using this method have shown that the oil treatment can reduce dust emissions. Repeated handling of the grain may necessitate additional oil treatment to prevent liberation of dust. However, before using this method, operators of grain handling facilities should be aware that the Food and Drug Administration must approve the specific oil treatment used on products for food and feed.

(I) As a part of the housekeeping program, grain elevators are required to address accumulations of dust at priority areas using the action level. The standard specifies a maximum accumulation of one-eighth inch dust, measurable by a ruler or other measuring device, anywhere within a priority area as the upper limit at which time employers must initiate action to remove the accumulations using designated means or methods. Any accumulation in excess of this amount and where no action has been initiated to implement cleaning would constitute a violation of the standard, unless the employer can demonstrate equivalent protection. Employers should make every effort to minimize dust accumulations on exposed surfaces since dust is the fuel for a fire or explosion, and it is recognized that a one-eighth inch dust accumulation is more than enough to fuel such occurrences.

(8) Filter collectors.

(a) Proper sizing of filter collectors for the pneumatic dust control system they serve is very important for the overall effectiveness of the system. The air to cloth ratio of the system should be in accordance with the manufacturer's recommendations. If higher ratios are used, they can result in more maintenance on the filter,

shorter bag or sock life, increased differential pressure resulting in higher energy costs, and an increase in operational problems.

(b) A photohelic gauge, magnehelic gauge, or manometer, may be used to indicate the pressure rise across the inlet and outlet of the filter. When the pressure exceeds the design value for the filter, the air volume will start to drop, and maintenance will be required. Any of these three monitoring devices is acceptable as meeting WAC 296-99-060(1).

(c) The employer should establish a level or target reading on the instrument which is consistent with the manufacturer's recommendations that will indicate when the filter should be serviced. This target reading on the instrument and the accompanying procedures should be in the preventive maintenance program. These efforts would minimize the blinding of the filter and the subsequent failure of the pneumatic dust control system.

(d) There are other instruments that the employer may want to consider using to monitor the operation of the filter. One instrument is a zero motion switch for detecting a failure of motion by the rotary discharge valve on the hopper. If the rotary discharge valve stops turning, the dust released by the bag or sock will accumulate in the filter hopper until the filter becomes clogged. Another instrument is a level indicator which is installed in the hopper of the filter to detect the buildup of dust that would otherwise cause the filter hopper to be plugged. The installation of these instruments should be in accordance with manufacturer's recommendations.

(e) All of these monitoring devices and instruments are to be capable of being read at an accessible location and checked as frequently as specified in the preventive maintenance program.

(f) Filter collectors on portable vacuum cleaners, and those used where fans are not part of the system, are not covered by requirements of WAC 296-99-060.

(9) Preventive maintenance.

(a) The control of dust and the control of ignition sources are the most effective means for reducing explosion hazards. Preventive maintenance is related to ignition sources in the same manner as housekeeping is related to dust control and should be treated as a major function in a facility. Equipment such as critical bearings, belts, buckets, pulleys, and milling machinery are potential ignition sources, and periodic inspection and lubrication of such equipment through a scheduled preventive maintenance program is an effective method for keeping equipment functioning properly and safely. The use of vibration detection methods, heat-sensitive tape or other heat detection methods that can be seen by the inspector or maintenance person will allow for a quick, accurate, and consistent evaluation of bearings and will help in the implementation of the program.

(b) The standard does not require a specific frequency for preventive maintenance. The employer is permitted flexibility in determining the appropriate interval for maintenance provided that the effectiveness of the maintenance program can be demonstrated. Scheduling of preventive maintenance should be based on manufacturer's recommendations for effective operation, as well

as from the employer's previous experience with the equipment. However, the employer's schedule for preventive maintenance should be frequent enough to allow for both prompt identification and correction of any problems concerning the failure or malfunction of the mechanical and safety control equipment associated with bucket elevators, dryers, filter collectors, and magnets. The pressure-drop monitoring device for a filter collector, and the condition of the lagging on the head pulley, are examples of items that require regularly scheduled inspections. A system of identifying the date, the equipment inspected and the maintenance performed, if any, will assist employers in continually refining their preventive maintenance schedules and identifying equipment problem areas. Open work orders where repair work or replacement is to be done at a designated future date as scheduled, would be an indication of an effective preventive maintenance program.

(c) It is imperative that the prearranged schedule of maintenance be adhered to regardless of other facility constraints. The employer should give priority to the maintenance or repair work associated with safety control equipment, such as that on dryers, magnets, alarm and shut-down systems on bucket elevators, bearings on bucket elevators, and the filter collectors in the dust control system. Benefits of a strict preventive maintenance program can be a reduction of unplanned downtime, improved equipment performance, planned use of resources, more efficient operations, and, most importantly, safer operations.

(d) The standard also requires the employer to develop and implement procedures consisting of locking-out and tagging equipment to prevent the inadvertent application of energy or motion to equipment being repaired, serviced, or adjusted, which could result in employee injury. All employees who have responsibility for repairing or servicing equipment, as well as those who operate the equipment, are to be familiar with the employer's lock and tag procedures. A lock is to be used as the positive means to prevent operation of the disconnected equipment. Tags are to be used to inform employees why equipment is locked out. Tags are to meet requirements in WAC 296-24-14001. Locks and tags may only be removed by employees that placed them, or by their supervisor, to ensure the safety of the operation.

(10) Grain stream processing equipment. The standard requires an effective means of removing ferrous material from grain streams so that such material does not enter equipment such as hammer mills, grinders, and pulverizers. Large foreign objects, such as stones, should have been removed at the receiving pit. Introduction of foreign objects and ferrous material into such equipment can produce sparks which can create an explosion hazard. Acceptable means for removal of ferrous materials include the use of permanent or electromagnets. Means used to separate foreign objects and ferrous material should be cleaned regularly and kept in good repair as part of the preventive maintenance program in order to maximize their effectiveness.

(11) Emergency escape. The standard specifies that at least two means of escape must be provided from galleries (bin decks). Means of emergency escape may include any available means of egress, consisting of three components, exit access, exit, and exit discharge as defined in WAC 296-24-55001, the use of controlled descent devices with landing velocities not to exceed fifteen ft./sec., or emergency escape ladders from galleries. Importantly, the means of emergency escape are to be addressed in the facility emergency action plan. Employees are to know the location of the nearest means of emergency escape and the action they must take during an emergency.

(12) Dryers. Liquefied petroleum gas-fired dryers should have the vaporizers installed at least ten feet from the dryer. The gas piping system should be protected from mechanical damage. The employer should establish procedures for locating and repairing leaks when there is a strong odor of gas or other signs of a leak.

(13) Inside bucket elevators.

(a) Hazards associated with inside bucket elevator legs are the source of many grain elevator fires and explosions. Therefore, to mitigate these hazards, the standard requires the implementation of special safety precautions and procedures, as well as the installation of safety control devices. The standard provides for a phase-in period for many of the requirements to provide the employer time for planning the implementation of the requirements. Additionally, for elevators with a permanent storage capacity of less than one million bushels, daily visual inspection of belt alignment and bucket movement can be substituted for alignment monitoring devices and motion detection devices.

(b) The standard requires that belts (purchased after the effective date of the standard) have surface electrical resistance not to exceed 300 megohms. Test methods available regarding electrical resistance of belts are: The American Society for Testing and Materials D257-76, "Standard Test Methods for D-C Resistance or Conductance of Insulating Materials"; and, the International Standards Organization's No. 284, "Conveyor Belts-Electrical Conductivity-Specification and Method of Test." When an employer has a written certification from the manufacturer that a belt has been tested using one of the above test methods, and meets the 300 megohm criteria, the belt is acceptable as meeting this standard. When using conductive belts, the employer should make certain that the head pulley and shaft are grounded through the drive motor ground or by some other equally effective means. When V-type drive belts are used to transmit power to the head pulley assembly from the motor drive shaft, it will be necessary to provide electrical continuity from the head pulley assembly to ground, e.g., motor grounds.

(c) Employers should also consider purchasing new belts that are flame retardant or fire resistive. A flame resistance test for belts is contained in 30 CFR 18.65.

[Statutory Authority: Chapter 49.17 RCW. 88-23-054 (Order 88-25), § 296-99-090, filed 11/14/88.]

**WAC 296-99-093 Appendix B, grain handling facilities. National consensus standards.**

The following table contains a cross-reference listing of current national consensus standards which provide information that may be of assistance to grain handling operations. Employers who comply with provisions in these national consensus standards that provide equal or greater protection than those in this chapter will be considered in compliance with the corresponding requirements in this chapter.

Subject	National consensus standards
Grain elevators and facilities handling bulk raw agricultural commodities . . . . .	ANSI/NFPA 61B
Feed mills . . . . .	ANSI/NFPA 61C
Facilities handling agricultural commodities for human consumption . . . . .	ANSI/NFPA 61D
Pneumatic conveying systems for agricultural commodities . . . . .	ANSI/NFPA 66
Guide for explosion venting . . . . .	ANSI/NFPA 68
Explosion prevention systems . . . . .	ANSI/NFPA 69
Dust removal and exhaust systems . . . . .	ANSI/NFPA 91

[Statutory Authority: Chapter 49.17 RCW. 88-23-054 (Order 88-25), § 296-99-093, filed 11/14/88.]

**WAC 296-99-095 Appendix C, grain handling facilities. References for further information.**

The following references provide information which can be helpful in understanding the requirements contained in various provisions of the standard, as well as provide other helpful information.

(1) Accident Prevention Manual for Industrial Operations; National Safety Council, 425 North Michigan Avenue, Chicago, Illinois 60611.

(2) Practical Guide to Elevator Design; National Grain and Feed Association, P.O. Box 28328, Washington, DC 20005.

(3) Dust Control for Grain Elevators; National Grain and Feed Association, P.O. Box 28328, Washington, DC 20005.

(4) Prevention of Grain Elevator and Mill Explosions; National Academy of Sciences, Washington, DC. (Available from National Technical Information Service, Springfield, Virginia 22151.)

(5) Standard for the Prevention of Fires and Explosions in Grain Elevators and Facilities Handling Bulk Raw Agricultural Commodities, NFPA 61B; National Fire Protection Association, Batterymarch Park, Quincy, Massachusetts 02269.

(6) Standard for the Prevention of Fire and Dust Explosions in Feed Mills, NFPA 61C; National Fire Protection Association, Batterymarch Park, Quincy, Massachusetts 02269.

(7) Standard for the Prevention of Fire and Dust Explosions in the Milling of Agricultural Commodities for Human Consumption, NFPA 61D; National Fire Protection Association, Batterymarch Park, Quincy, Massachusetts 02269.

(8) Standard for Pneumatic Conveying Systems for Handling Feed, Flour, Grain and Other Agricultural

Dusts, NFPA 66; National Fire Protection Association, Batterymarch Park, Quincy, Massachusetts 02269.

(9) Guide for Explosion Venting, NFPA 68; National Fire Protection Association, Batterymarch Park, Quincy, Massachusetts 02269.

(10) Standard on Explosion Prevention Systems, NFPA 69; National Fire Protection Association, Batterymarch Park, Quincy, Massachusetts 02269.

(11) Safety-Operations Plans; United States Department of Agriculture, Washington, DC 20250.

(12) Inplant Fire Prevention Control Programs; Mill Mutual Fire Prevention Bureau, 1 Pierce Place, Suite 1260 West, Itasca, Illinois 60143-1269.

(13) Guidelines for Terminal Elevators; Mill Mutual Fire Prevention Bureau, 1 Pierce Place, Suite 1260 West, Itasca, Illinois 60143-1269.

(14) Standards for Preventing the Horizontal and Vertical Spread of Fires in Grain Handling Properties; Mill Mutual Fire Prevention Bureau, 1 Pierce Place, Suite 1260 West, Itasca, Illinois 60143-1269.

(15) Belt Conveyors for Bulk Materials, Part I and Part II, Data Sheet 570, Revision A; National Safety Council, 425 North Michigan Avenue, Chicago, Illinois 60611.

(16) Suggestions for Precautions and Safety Practices in Welding and Cutting; Mill Mutual Fire Prevention Bureau, 1 Pierce Place, Suite 1260 West, Itasca, Illinois 60143-1269.

(17) Food Bins and Tanks, Data Sheet 524; National Safety Council, 425 North Michigan Avenue, Chicago, Illinois 60611.

(18) Pneumatic Dust Control in Grain Elevators; National Academy of Sciences, Washington, DC. (Available from National Technical Information Service, Springfield, Virginia 22151.)

(19) Dust Control Analysis and Layout Procedures for Grain Storage and Processing Plants; Mill Mutual Fire Prevention Bureau, 1 Pierce Place, Suite 1260 West, Itasca, Illinois 60143-1269.

(20) Standard for the Installation of Blower and Exhaust Systems for Dust, Stock and Vapor Removal, NFPA 91; National Fire Protection Association, Batterymarch Park, Quincy, Massachusetts 02269.

(21) Standards for the Installation of Direct Heat Grain Dryers in Grain and Milling Properties; Mill Mutual Fire Prevention Bureau, 1 Pierce Place, Suite 1260 West, Itasca, Illinois 60143-1269.

(22) Guidelines for Lubrication and Bearing Maintenance; Mill Mutual Fire Prevention Bureau, 1 Pierce Place, Suite 1260 West, Itasca, Illinois 60143-1269.

(23) Organized Maintenance in Grain and Milling Properties; Mill Mutual Fire Prevention Bureau, 1 Pierce Place, Suite 1260 West, Itasca, Illinois 60143-1269.

(24) Safe and Efficient Elevator Legs for Grain and Milling Properties; Mill Mutual Fire Prevention Bureau, 1 Pierce Place, Suite 1260 West, Itasca, Illinois 60143-1269.

(25) Explosion Venting and Suppression of Bucket Elevators; National Grain and Feed Association, P.O. Box 28328, Washington, DC 20005.

(26) Lightning Protection Code, NFPA 78; National Fire Protection Association, Batterymarch Park, Quincy, Massachusetts 02269.

(27) Occupational Safety in Grain Elevators, DHHS (NIOSH) Publication No. 83-126; National Institute for Occupational Safety and Health, Morgantown, West Virginia 26505.

(28) Retrofitting and Constructing Grain Elevators; National Grain and Feed Association, P.O. Box 28328, Washington, DC 20005.

(29) Grain Industry Safety and Health Center-Training Series. (Preventing grain dust explosions, operations maintenance safety, transportation safety, occupational safety and health); Grain Elevator and Processing Society, P.O. Box 15026, Commerce Station, Minneapolis, Minnesota 55415-0026.

(30) Suggestions for Organized Maintenance; The Mill Mutuals Loss Control Department, 1 Pierce Place, Suite 1260 West, Itasca, Illinois 60143-1269.

(31) Safety-The First Step to Success; The Mill Mutuals Loss Control Department, 1 Pierce Place, Suite 1260 West, Itasca, Illinois 60143-1269.

(32) Emergency Plan Notebook; Schoeff, Robert W. and James L. Balding, Kansas State University, Cooperative Extension Service, Extension Grain Science and Industry, Shellenberger Hall, Manhattan, Kansas 66506.

[Statutory Authority: Chapter 49.17 RCW. 88-23-054 (Order 88-25), § 296-99-095, filed 11/14/88.]

## Chapter 296-100 WAC

### SAFETY REQUIREMENTS FOR MATERIAL HOISTS

#### WAC

296-100-001	Scope.
296-100-010	Material hoist platforms.
296-100-020	Inside material hoist shaftways.
296-100-030	Outside hoisting towers.
296-100-040	Hoisting machines.
296-100-050	Capacity plate.
296-100-060	Safety requirements for material hoists.

**WAC 296-100-001 Scope.** This standard applies to the design, construction, installation, operation, inspection, testing, maintenance, alterations, and repair of material hoists used to raise or lower materials during construction, alteration, or demolition. It is not applicable to the temporary use of permanently installed personnel elevators as material hoists.

[Statutory Authority: RCW 70.87.080, 70.87.090 and 70.87.100. 86-03-031 (Order 86-10), § 296-100-001, filed 1/10/86.]

**WAC 296-100-010 Material hoist platforms.** (1) Material hoist platforms shall be substantially constructed and of sufficient strength with a factor of safety of five for the rated load and capacity.

(2) Overhead protective covering of planking or heavy wire mesh shall be provided on the cross-head of every material hoist platform to prevent objects falling on the workmen when loading or unloading the hoist.

(3) The protection on the cross-head shall be made in sections and each section hinged, so they may be raised when hoisting long material.

(4) When using a hoist for long material, the several pieces of the material shall be securely fastened together, and made fast to the hoist so that no part of the load can fall or project beyond the sides of the hoist.

(5) Provide suitable blocking and cleats on all platforms when wheelbarrows or other rolling equipment are transported to hold them securely in place.

(6) Workmen shall not be allowed to ride on material hoists and a sign prohibiting such practice shall be posted on the cross bar of the platform or on the shaftway enclosure at each floor opening.

(7) The platforms of every hoist shall be enclosed on all sides where openings are not to be left with toeboards and a heavy wire screen enclosure formed of number sixteen U.S. gauge wire, one and one-half inch mesh.

[Order 70-11, § 296-100-010, filed 9/18/70, effective 10/21/70.]

**WAC 296-100-020 Inside material hoist shaftways.**

(1) All material hoist shaftways erected inside buildings shall preferably be enclosed tightly their entire height. When this is not practicable, the sides of shaftway not used for entrance shall be enclosed on each floor to a height of at least eight feet with wire netting formed of not less than number sixteen U.S. gauge wire, one and one-half inch mesh, or enclosed with wooden slats spaced vertically not more than four inches apart, with a toeboard placed around all sides except at the entrance.

(2) When two material shaftways are erected side by side, similar protection shall be placed between them.

(3) The enclosure shall extend at least two feet in front of the shaftway unless the entrances are protected with gates.

(4) All entrances into the shaftway shall be protected by hinges or pivoted bars or gates.

If bars are used, they shall not be less than two by three inches in section, placed at a height of not less than three feet nor more than four feet above the floor and located not nearer than two feet from the shaftway.

The bar shall be bolted to one side of the enclosure frame by a single bolt on which the bar may swing, and a slot provided at the opposite side to receive the end of the bar when it is lowered to a horizontal position. A hook or wooden button shall be provided to hold the bar up out of the way while loading or unloading the hoist.

If a gate is used, it shall be located not nearer than six inches from the front of the shaftway, at least five and one-half feet high, and the bottom not more than two inches off the floor.

(5) The guide rails of all hoists shall be kept rigid and in perfect alignment at all times.

(6) The guide rails shall be of sound lumber or steel of adequate uniform size to provide a firm track.

(7) Overhead sheave beams and their supports shall be of good sound timber or steel of strength and stiffness with a factor of safety of five to support the combined live and dead loads imposed.

(8) Protective covering of planking or heavy wire netting shall be provided above the overhead work of all hoists to prevent objects falling down the shaftway.

[Order 70-11, § 296-100-020, filed 9/18/70, effective 10/21/70.]

**WAC 296-100-030 Outside hoisting towers.** (1) Material hoist towers erected outside of buildings shall be constructed of strong, sound material and of ample strength with a factor of safety of five to carry the loads intended.

(2) Foundations for hoist towers shall be sufficiently large to spread the hoist load so that it will not exceed the safe bearing capacity of the soil on which it stands. Foundations shall be level.

(3) Hoist towers shall be erected plumb, square at the corners and sufficiently braced to make them rigid and stable.

(4) All splicing material on posts shall be not less than two inches in thickness, four feet long, and shall be spiked or bolted to at least two adjacent sides of the posts. All splices shall be staggered.

(5) An approved ladder securely fastened to the tower shall extend its entire height.

(6) Hoist towers shall be securely guyed and well anchored.

(7) The guys shall be securely clamped to "dead men" of sufficient size and well buried.

(8) Platforms of ample size and strength with railings and toeboards shall be built at each level where men work.

(9) Hoist towers shall be enclosed on all sides to a height of eight feet at lower landing with wire screen enclosure formed of number sixteen U.S. gauge wire, and one and one-half inch mesh, or other suitable material, securely fastened to the tower structure to prevent access to the space under any hoist platform.

(10) The overhead framework of all towers shall be of sufficient strength to take the total load of all sheaves, car and material to be hoisted with a factor of safety of five.

(11) When extremely high hoist towers are to be erected, and it is not practical to fully secure this tower by means of bracing or guys, they shall be built in sections, by erecting the lower section to an altitude to suffice for immediate needs, and extending it upward when the construction work has progressed sufficiently to make it possible to provide a support or bracing for the tower.

(12) Standard railing and toeboards shall be placed on the open sides of runways connecting the tower to the structure, and a bar or gate provided at all openings into the tower.

[Order 70-11, § 296-100-030, filed 9/18/70, effective 10/21/70.]

**WAC 296-100-040 Hoisting machines.** (1) All gearing on hoisting machines shall be enclosed. If electrical equipment is used, it shall be effectively grounded.

(2) Hoisting machines shall be of ample capacity and equipped with brakes capable of sustaining one hundred and fifty percent of rated load for stopping and sustaining the maximum load in any position.



(3) Hoisting machines shall be protected against the weather and falling objects by a substantial covering.

(4) All hoisting equipment shall be frequently inspected, and brakes, gears and operating levers kept in perfect working condition.

(5) Guards shall be provided to prevent persons coming in contact with hoisting cables.

(6) Brake drums shall be kept free of oil or grease, as it prevents the brake from holding the load.

[Order 70-11, § 296-100-040, filed 9/18/70, effective 10/21/70.]

**WAC 296-100-050 Capacity plate.** Rated load capacities, recommended operating speeds, and special hazard warning or instructions shall be posted on cars and platforms.

[Statutory Authority: RCW 70.87.080, 70.87.090 and 70.87.100. 86-03-031 (Order 86-10), § 296-100-050, filed 1/10/86.]

**WAC 296-100-060 Safety requirements for material hoists.** All material hoists shall conform to the requirements of ANSI A10.5-1981.

[Statutory Authority: RCW 70.87.080, 70.87.090 and 70.87.100. 86-03-031 (Order 86-10), § 296-100-060, filed 1/10/86.]

### Chapter 296-104 WAC

#### BOARD OF BOILER RULES—SUBSTANTIVE

##### WAC

296-104-001	Promulgation.
296-104-002	Approval by director.
296-104-010	Definitions.
296-104-015	Board meetings.
296-104-020	Administration—Filing requirements before installation.
296-104-025	Administration—Owner to notify chief inspector in case of accident.
296-104-030	Administration—Penalty for operation of unsafe boilers or unfired pressure vessels.
296-104-035	Administration—Inspectors to have no other interests.
296-104-040	Administration—Inspectors to submit reports.
296-104-045	Administration—Insurance companies to notify the chief inspector of new, canceled or suspended risks.
296-104-050	Administration—Examination for inspector.
296-104-055	Examination fees.
296-104-060	Commissions as inspectors.
296-104-065	Administration—Reciprocal commissions.
296-104-100	Inspection—Frequency of inspections.
296-104-105	Inspection—Notification of inspection.
296-104-110	Inspection—Inspectors to notify the chief inspector of defective boilers or unfired pressure vessels.
296-104-115	Inspection—Defective conditions disclosed at time of external inspection.
296-104-120	Inspection—Condemned boilers or unfired pressure vessel.
296-104-125	Inspection—Certificate fees.
296-104-130	Inspection—Validity of inspection certificate.
296-104-135	Inspection—Restamping of boilers and unfired pressure vessels.
296-104-140	Inspection—State stamp.
296-104-145	Inspection of systems.
296-104-150	Inspection of systems—Unfired steam boilers.
296-104-155	Inspection of systems—Preparation for internal inspection.
296-104-160	Inspection of systems—Boilers or unfired pressure vessels improperly prepared for inspection.
296-104-165	Inspection of systems—Removal of covering to permit inspection.

296-104-170	Inspection of systems—Shop inspections.
296-104-200	Standards for new construction.
296-104-205	Inspection of systems—Nonstandard regulations.
296-104-210	Inspection of systems—Special designs.
296-104-215	Inspection of systems—Nonstandard boilers and unfired pressure vessels.
296-104-220	Inspection of systems—Nonstandard second hand boilers or unfired pressure vessels.
296-104-225	Inspection of systems—Reinstalled boiler or unfired pressure vessel.
296-104-230	Inspection of systems—Hot water supply boilers and tanks.
296-104-235	Inspection of systems—Safety relief valves.
296-104-240	Inspection of systems—Unfired pressure vessels fabricated of pipe or pipe fittings.
296-104-245	Inspection of systems—Oil heaters.
296-104-255	Inspection of systems—Clearance at top of boilers.
296-104-260	Inspection of systems—Clearance front, back and sides.
296-104-265	Inspection of systems—Control and limit devices.
296-104-270	Inspection of systems—Explosion doors.
296-104-285	Unfired pressure vessels in places of public assembly.
296-104-300	New installations—Ladders and runways.
296-104-305	New installations—Exits from boiler rooms.
296-104-310	New installations—Discharge from safety valves, blow offs and drains.
296-104-320	New installations—Underground installations.
296-104-325	New installations—Supports.
296-104-330	New installations—Pressure reducing valves.
296-104-400	Existing installations—Stamping of existing boilers and unfired pressure vessels.
296-104-405	Existing installations—Existing boiler or unfired pressure vessels.
296-104-410	Existing installations—Noncode steel heating boilers.
296-104-415	Existing installations—Noncode cast iron boilers.
296-104-500	Nonnuclear repairs.
296-104-501	Nonnuclear alterations.
296-104-505	Repairs—Repairs by fusion welding.
296-104-510	Repairs—Riveted patches.
296-104-515	Nonnuclear repairs—Safety devices.
296-104-520	Repairs—Lap seam crack.
296-104-525	Repairs—Hydrostatic pressure tests.
296-104-530	Repairs—Air or vapor testing.
296-104-600	General requirements—Conditions not covered by these rules.
296-104-700	Inspection fees—Certificate fees—Expenses.
296-104-701	Civil penalties.
296-104-800	Inspection of systems subject to radioactivity.

#### DISPOSITION OF SECTIONS FORMERLY CODIFIED IN THIS CHAPTER

296-104-201	Inspection of systems—Standard for water chillers. [Statutory Authority: RCW 70.79.030. 80-14-015 (Order 80-12), § 296-104-201, filed 9/23/80.] Repealed by 86-01-088 (Order 85-26), filed 12/19/85. Statutory Authority: RCW 70.79.040 and 70.79.050.
296-104-250	Inspection of systems—Hot water heating systems. [Part IV, § 11, filed 3/23/60.] Repealed by 78-03-057 (Order 78-3), filed 2/22/78. Statutory Authority: RCW 70.79.030.
296-104-275	Inspection of systems—Hydro-pneumatic tanks. [Part IV, § 16, filed 3/23/60.] Repealed by 78-03-057 (Order 78-3), filed 2/22/78. Statutory Authority: RCW 70.79.030.
296-104-280	Inspection of systems—Electric steam generators. [Part IV, § 17, filed 3/23/60.] Repealed by 78-03-057 (Order 78-3), filed 2/22/78. Statutory Authority: RCW 70.79.030.
296-104-315	New installations—Blow off tanks. [Statutory Authority: RCW 70.79.030. 78-03-057 (Order 78-3), § 296-104-315, filed 2/22/78; Part V, § 4, filed 3/23/60.] Repealed by 89-15-025 (Order 89-05), filed 7/13/89, effective 8/13/89. Statutory Authority: Chapter 70.79 RCW.



**WAC 296-104-001 Promulgation.** The following rules and regulations apply to all boilers and unfired pressure vessels except those exempt under section 8, chapter 32, Laws of 1951 (RCW 70.79.080). Boilers and unfired pressure vessels listed under section 9, chapter 32, Laws of 1951 (RCW 70.79.090) are exempt from inspection and fees, but shall comply with all rules for construction, installation, repairs and general requirements.

The following rules and regulations were formulated in accordance with the law and are hereby promulgated.  
Date: December 18, 1958.

[Promulgation, filed 3/23/60.]

**WAC 296-104-002 Approval by director.** The following rules and regulations are hereby approved. They have the force and effect of law in accordance with section 5, chapter 32, Laws of 1951 (RCW 70.79.050).

Date: December 24, 1958

Department of Labor and Industries,  
Jerry Hagan, Director

[Approval, filed 3/23/60.]

**WAC 296-104-010 Definitions.** (1) "Director" shall mean the director of the department of labor and industries.

(2) "Board of boiler rules" shall mean the board created by law and empowered to make, alter, amend, and interpret rules and regulations for the safe and proper construction, installation, repair, and use of boilers and for the proper construction, installation, and repair of unfired pressure vessels in this state.

(3) "Chief inspector" shall mean the chief boiler inspector appointed under RCW 70.79.100.

(4) "Deputy inspector" shall mean a deputy inspector of boilers and unfired pressure vessels appointed by the chief boiler inspector of Washington under the provisions of RCW 70.79.120.

(5) "Special inspector" shall mean an inspector holding a Washington commission, who is regularly employed by an insurance company authorized to insure against loss from explosion of boilers and unfired pressure vessels in this state, or who is continuously employed by any company operating unfired pressure vessels in this state for the purpose of making inspections of unfired pressure vessels used or to be used by such company.

(6) "Inspector" shall mean the chief boiler inspector, a deputy inspector, or a special inspector.

(7) "Certificate of competency" shall mean a certificate issued to a person who has passed an examination prescribed by the board of boiler rules.

(8) "Department" as used herein shall mean the department of labor and industries of the state of Washington.

(9) "Owner" or "user" shall mean a person, firm, or corporation owning or operating any boiler or unfired pressure vessel within the state.

(10) "ASME Code" shall mean the boiler and pressure vessel code of the American Society of Mechanical

Engineers with amendments and interpretations thereto made and approved by the council of the society which have been regularly adopted by the board of boiler rules in accordance with the provisions of RCW 70.79.030.

(11) "Existing installations" shall mean any boiler or unfired pressure vessel constructed, installed, placed in operation, or contracted for before January 1, 1952.

(12) "Approved" shall mean approved by the chief boiler inspector as evidenced by his issuance of an inspection certificate.

(13) "Standard boiler or unfired pressure vessel" shall mean a boiler or unfired pressure vessel which bears the ASME stamp.

(14) "Nonstandard boiler or unfired pressure vessel" shall mean a boiler or unfired pressure vessel that does not bear the ASME stamp.

(15) "Boiler" shall mean a closed vessel used for heating water or liquid or for generating steam or vapor by the direct application of heat.

(16) "Direct application of heat" shall mean the firing of any fuel, solid, liquid, or gaseous, including electrical elements of any description.

(17) "Power boiler" shall mean a boiler used to produce steam or vapor at a pressure exceeding 15 lbs. per square inch gage, or a boiler used for heating water or liquid to a pressure exceeding 160 psi. or to a temperature exceeding 250°F.

(18) "Low pressure heating boiler" shall mean a boiler operated at a pressure not exceeding 15 lbs. per square inch gage steam, or at a pressure not exceeding 160 lbs. per square inch and a temperature not exceeding 250°F. for water.

(19) "Hot water supply boiler" shall mean a low pressure boiler used to heat water to a temperature not exceeding 200°F.

(20) "Unfired steam boiler" shall mean a pressure vessel in which steam is generated by an indirect application of heat.

(21) "Unfired pressure vessel" shall mean a closed vessel in which pressure is obtained from an external source, or from an indirect application of heat, including steam or hot water coils, converters or heat exchangers.

(22) "Reinstalled boiler or unfired pressure vessel" shall mean a boiler or unfired pressure vessel removed from its original setting and reerected at the same location or at a new location without change of ownership.

(23) "Second hand boiler or unfired pressure vessel" shall mean a boiler or unfired pressure vessel of which both the location and ownership have changed after primary use.

(24) "Condemned boiler or unfired pressure vessel" shall mean a boiler or unfired pressure vessel that has been inspected and declared unsafe or disqualified by legal requirements by an inspector who has applied a stamping or marking designating its condemnation.

(25) "Internal inspection" shall mean an inspection made when a boiler or unfired pressure vessel is shut down and handholes, manholes, or other inspection

openings are open or removed for inspection of the interior. An ultrasonic examination of unfired pressure vessels 36" diameter and under, shall constitute an internal inspection.

(26) "External inspection" shall mean an inspection made while a boiler or unfired pressure vessel is in operation and includes the inspection and demonstration of controls and safety devices.

(27) "Place of public assembly" shall mean a building used in whole or in part for occupation by persons for such purposes as worship, hospitals, education, instruction, entertainment, amusement, waiting transportation, or child care centers.

Child care centers include those agencies which operate facilities for the care of thirteen children or more. No such center shall be located in a private family residence. The substantive rules of this code shall apply to all child care centers operated in the state of Washington.

(28) "Fusion welding" shall mean a process of welding metals in a molten, or molten and vaporous state, without the application of mechanical pressure or blows. Such welding may be accomplished by the oxy-acetylene or oxy-hydrogen flame or by the electric arc. Thermit welding shall be classified as fusion welding.

(29) "Major repair" shall mean one upon which the strength of a boiler or unfired pressure vessel depends.

(30) "Agriculture purposes" shall mean any act performed on a farm in production of crops or livestock, and shall include the storage of such crops and livestock in their natural state, but shall not be construed to include the processing or sale of crops or livestock.

(31) "Attendant" shall mean the person in charge of the operation of a boiler or unfired pressure vessel.

(32) "Automatic operation of a boiler" shall mean full control of feed water and fuel in order to maintain the pressure and temperature constant within the limits set. Controls must be such that the operation follows the demand without interruption. Manual restart may be required when the burner is off because of low water, flame failure, or power failure.

(33) "Alteration" is a structural modification of, or a departure from an original design or existing construction.

(34) "Repair" is a restoration of any damaged or impaired part to an effective and safe condition.

[Statutory Authority: RCW 70.79.240, 88-01-064 (Order 87-25), § 296-104-010, filed 12/17/87. Statutory Authority: RCW 70.79.040 and 70.79.050, 86-01-088 (Order 85-26), § 296-104-010, filed 12/19/85; Order 72-11, § 296-104-010, filed 7/7/72; Part I, filed 3/23/60.]

**WAC 296-104-015 Board meetings.** The board of boiler rules shall hold its regular meetings on the third Tuesday of January, March, May, September and November of each year, the time and place of each regular meeting to be set by the chairman of the board.

[Statutory Authority: RCW 70.79.040 and 70.79.050, 86-01-088 (Order 85-26), § 296-104-015, filed 12/19/85; Order 72-11, § 296-104-015, filed 7/7/72.]

(1989 Ed.)

**WAC 296-104-020 Administration--Filing requirements before installation.** Manufacturers data reports on boilers and pressure vessels as required by the provisions of the ASME Code and the National Board of Boiler and Pressure Vessel Inspectors shall be filed by the owner or his agent with the chief inspector before installation. When the boilers or pressure vessel are of special design or construction not covered by the ASME Code (unless otherwise exempted by the rules and regulations), the proposed owner or user shall apply to the chief inspector in writing for permission to install such boilers or pressure vessels and shall supply such details of design and construction as may be required by the chief inspector and his approval shall be secured before construction is started. When used or second hand boilers or pressure vessels are to be installed, the owner or user shall similarly apply and secure approval before starting installation.

[Order 74-37, § 296-104-020, filed 11/8/74; Part II, § 1, filed 3/23/60.]

**WAC 296-104-025 Administration--Owner to notify chief inspector in case of accident.** When an accident occurs which serves to render a boiler or unfired pressure vessel inoperative, the owner or user shall immediately notify the chief inspector, and submit a detailed report of the accident. In case of serious accident, such as explosion, notice shall be given immediately by telephone, telegraph, or messenger and neither the boiler or unfired pressure vessel nor any parts thereof shall be removed or disturbed before and inspection has been made by the chief inspector, deputy inspector or special inspector, unless for the purpose of saving life. The inspector making the investigation and inspection shall report to the chief inspector as soon as possible.

[Part II, § 2, filed 3/23/60.]

**WAC 296-104-030 Administration--Penalty for operation of unsafe boilers or unfired pressure vessels.** If upon inspection a boiler or unfired pressure vessel is found to be in such condition that it is unsafe to operate, the inspection certificate shall be suspended by the inspector. Any person, firm, partnership, or corporation causing such objects to be operated without a valid certificate of inspection shall be subject to the provisions of RCW 70.79.310.

[Part II, § 3, filed 3/23/60.]

**WAC 296-104-035 Administration--Inspectors to have no other interests.** Inspectors commissioned by the state of Washington shall not be engaged in the sale of any article or device related to boilers or unfired pressure vessels and shall devote their full time to inspection work.

[Part II, § 4, filed 3/23/60.]

**WAC 296-104-040 Administration--Inspectors to submit reports.** Inspectors shall submit reports of inspections of boilers and pressure vessels on appropriate forms as approved by the chief inspector. Reports of inspections shall be submitted within thirty days of inspection.

[Title 296 WAC--p 1777]

Requests for variance from regular inspection date shall be in writing. When hazardous conditions are discovered during any inspection remedial action shall be initiated at once and reported to the chief inspector.

[Order 74-37, § 296-104-040, filed 11/8/74; Part II, § 5, filed 3/23/60.]

**WAC 296-104-045 Administration--Insurance companies to notify the chief inspector of new, canceled or suspended risks.** All insurance companies shall notify the chief inspector within thirty days of all boiler or unfired pressure vessel risks written, canceled, not renewed or suspended because of unsafe conditions.

[Part II, § 6, filed 3/23/60.]

**WAC 296-104-050 Administration--Examination for inspector.** Examination for certificate of competency as inspector of boilers shall be held at the office of the chief boiler inspector for the state of Washington, or at any location to be selected by the board, four times each year, namely, the first Wednesday of the months of March, June, September and December. Special examinations will be held when considered necessary by the board.

Applicants for examination shall have had at least three years practical experience in the construction, maintenance, repair or operation of high pressure boilers or unfired pressure vessels as a mechanical engineer, steam engineer or boiler maker, or shall have had at least three years experience as an inspector of high pressure boilers. A credit of two years of the required experience will be given to applicants holding an engineering degree from a recognized college of engineering.

Application for examination for certificate of competency shall be in writing upon a form to be furnished by the director stating the school education of the applicant, a list of his employers, his period of employment and position held with each employer. Applications containing willful falsification or untruthful statements shall be rejected. If the applicant's history and experience meet with the approval of the board of boiler rules, he shall be given a written examination dealing with the construction, installation, operation, maintenance and repair of boilers and unfired pressure vessels and their appurtenance, and the applicant shall be accepted or rejected on the merits of this examination. If the applicant is successful in meeting the requirements of the examining board, a certificate of competency will be issued by the chief inspector. After the expiration of ninety days, an applicant who fails to pass the examination will be permitted to take another written examination, and his acceptance or rejection will be determined by the board on the basis of this examination.

[Statutory Authority: Chapter 70.79 RCW. 89-15-025 (Order 89-05), § 296-104-050, filed 7/13/89, effective 8/13/89. Statutory Authority: RCW 70.79.030. 78-03-057 (Order 78-3), § 296-104-050, filed 2/22/78; Part II, § 7, filed 3/23/60.]

**WAC 296-104-055 Examination fees.** A fee of forty dollars will be charged for each applicant taking

the examination for a certificate of competency or any examination sponsored by the National Board of Boiler and Pressure Vessel Inspectors. If an applicant fails to pass the examination this fee shall be good for one year during which a reexamination may be taken. Checks for examination fees shall be made payable to the state treasurer.

[Statutory Authority: RCW 70.79.030 and 70.79.330. 82-24-025 (Order 82-36), § 296-104-055, filed 11/23/82, effective 1/1/83; Order 74-37, § 296-104-055, filed 11/8/74; Part II, § 8, filed 3/23/60.]

**WAC 296-104-060 Commissions as inspectors.** Upon the request of any company authorized to insure and insuring against loss from explosion of boilers and pressure vessels in this state, or upon the request of any company operating pressure vessels in this state, the chief inspector shall issue a commission as a special inspector and an identifying commission card to any inspector actively engaged in boiler or pressure vessel inspection in this state if the inspector is employed by the requesting company and if the inspector has passed the written examination and holds a certificate of competency as set forth in WAC 296-104-050. The fee for the commission is twenty-five dollars. The commission shall be held at the home office of the employing company. Inspectors shall carry identifying commission cards while they are inspecting. A commission shall be valid for one year and may be renewed annually at the request of the employing company for a fee of ten dollars. The employing company shall return the commission and the identifying commission card at once to the chief inspector when the inspector to whom the commission was issued is no longer in its employ, or at the request of the chief inspector. The department may suspend or revoke a certificate of competency and commission issued to an inspector upon ten days notice to the inspector and to the inspector's employer for incompetency or untrustworthiness; for wilful falsification of any matter or statement contained in his application, or in the report of any inspection, or in any other application, or in the report of any inspection; or for other sufficient reason. The holder of a certificate of competency is entitled to a hearing before the board before the revocation or suspension of the certificate of competency. A person whose commission has been suspended, except for untrustworthiness, may apply to the board for reinstatement. A person whose commission has been revoked, except for untrustworthiness, may apply to the board to take a new examination for a commission after ninety days from the date of the revocation.

[Statutory Authority: RCW 70.79.030 and 70.79.330. 82-24-025 (Order 82-36), § 296-104-060, filed 11/23/82, effective 1/1/83; Order 74-37, § 296-104-060, filed 11/8/74; Part II, § 9, filed 3/23/60.]

**WAC 296-104-065 Administration--Reciprocal commissions.** Upon the request of a boiler insurance company authorized to insure and insuring against loss from explosion of boilers and pressure vessels in this state, a commission as a special inspector shall be issued by the chief inspector to an inspector in the employ of

such company provided the inspector has had the experience prescribed in RCW 70.79.130 and holds a certificate of competency or commission issued by a state which has adopted one or more sections of the ASME Code and which holds a written examination equivalent to that required by the state of Washington and a national board commission. Application for a reciprocal commission shall be made on a form to be furnished by the chief inspector, and shall be accompanied by a photostatic copy of the applicant's commission and certificate of competency.

[Statutory Authority: RCW 70.79.030, 78-03-057 (Order 78-3), § 296-104-065, filed 2/22/78; Order 74-37, § 296-104-065, filed 11/8/74; Part II, § 10, filed 3/23/60.]

**WAC 296-104-100 Inspection--Frequency of inspections.** Power boilers shall be inspected annually both internally and externally while not under pressure, and annually externally while under pressure.

Low pressure heating boilers shall be inspected externally biennially. Where construction permits, they shall in addition be inspected internally at the same time.

Unfired pressure vessels shall be inspected externally biennially. Where subject to corrosion and construction permits they shall in addition be inspected internally biennially.

Unfired pressure vessels not subject to internal corrosion shall be inspected externally biennially.

[Part III, § 1, filed 3/23/60.]

**WAC 296-104-105 Inspection--Notification of inspection.** The owner or user shall prepare each boiler and unfired pressure vessel for internal inspection and shall prepare for and apply a hydrostatic pressure test whenever necessary on the date specified by the inspector, which date shall not be less than seven days after the date of notification.

[Part III, § 2, filed 3/23/60.]

**WAC 296-104-110 Inspection--Inspectors to notify the chief inspector of defective boilers or unfired pressure vessels.** If an inspector, upon inspection of a boiler or unfired pressure vessel or any of their appurtenances finds that they do not comply with the Washington state boiler and unfired pressure vessels law rules and regulations, he shall immediately notify the chief inspector and submit a report of the defects.

[Part III, § 3, filed 3/23/60.]

**WAC 296-104-115 Inspection--Defective conditions disclosed at time of external inspection.** If upon an external inspection there is evidence of a leak or crack, enough of the covering of the boiler or unfired pressure vessel shall be removed to satisfy the inspector in order that he may determine as to the safety of the boiler or unfired pressure vessel, or if the covering cannot be removed at the time, he may order the operation of the boiler or unfired pressure vessel stopped until such time as the covering can be removed and proper examination made.

(1989 Ed.)

[Part III, § 4, filed 3/23/60.]

**WAC 296-104-120 Inspection--Condemned boilers or unfired pressure vessel.** Any boiler or unfired pressure vessel having been inspected and declared unsafe by the inspector, shall be stamped by the inspector with an arrowhead stamp having an overall length of 1/2 inch and width of 3/8 inch on either side of the letter "X" and the letter "W," as shown by the following facsimile, which will designate a condemned boiler or unfired pressure vessel.

[Part III, § 5, filed 3/23/60.]

**WAC 296-104-125 Inspection--Certificate fees.** If upon inspection a boiler or unfired pressure vessel is found to be suitable for use and to conform to these rules and regulations, the owner or user shall pay directly to the chief inspector fees as scheduled in RCW 70.79.290. Inspections are not complete until the certificate of inspection is posted.

If the owner or user of each boiler or unfired pressure vessel required to be inspected refuses to allow an inspection to be made, or refuses to pay the above fee, the certificate of inspection shall be suspended by the chief inspector until the owner or user complies with the requirements.

[Part III, § 6, filed 3/23/60.]

**WAC 296-104-130 Inspection--Validity of inspection certificate.** An inspection certificate, issued in accordance with RCW 70.79.290, shall be valid until expiration unless some defect or condition affecting the safety of the boiler or unfired pressure vessel is disclosed: *Provided, however,* That a certificate issued for a boiler or unfired pressure vessel inspected by a special inspector shall be valid only if the boiler or unfired pressure vessel for which it was issued continues to be insured by a duly authorized insurance company or operated by a duly authorized company.

[Part III, § 7, filed 3/23/60.]

**WAC 296-104-135 Inspection--Restamping of boilers and unfired pressure vessels.** When the stamping on a boiler or unfired pressure vessel becomes indistinct the inspector shall instruct the owner or user to have it restamped. Request for permission to restamp the boiler or unfired pressure vessel shall be made to the chief inspector and proof of the original stamping shall accompany the request authorized by the chief inspector. Restamping authorized by the chief inspector shall be done only by an inspector, and shall be identical with the original stamping except that it will not be required to restamp the ASME symbol. Notice of completion of such restamping shall be filed with the chief boiler inspector by the inspector who stamped the boiler or unfired pressure vessel together with a facsimile of the stamping applied.

[Part III, § 8, filed 3/23/60.]

**WAC 296-104-140 Inspection--State stamp.** Upon completion of the installation, all boilers and unfired

[Title 296 WAC--p 1779]

pressure vessels shall be inspected by the chief inspector, a deputy inspector, or a special inspector. At the time of this inspection, each boiler or unfired pressure vessel shall be stamped with a serial number of the state of Washington followed by the letter "W," said letter and figures to be not less than 5/16 in. in height. The stamping shall not be concealed by lagging or paint and shall be exposed at all times. A metal tag 1 inch by 3 inches minimum, with the state number stamped thereon may be used where construction does not permit a direct stamp on the boiler or unfired pressure vessel.

Data sheets properly filled in and signed shall be made available at the time of first inspection.

Washington special numbers when assigned by the chief inspector shall be preceded by the letters: WS.

[Order 73-1, § 296-104-140, filed 3/22/73; Part III, § 9, filed 3/23/60.]

**WAC 296-104-145 Inspection of systems.** A group of unfired pressure vessels operating as a single unit such as the vessels in a refrigeration system, evaporators, ironers and paper machines shall be classed as a single unit and shall be given one number, designating the different vessels of the unit as a-b-c, etc. The inspector's report shall cover all pressure vessels in the system. One certificate shall be issued for the unit. Certificate charge shall be as outlined in RCW 70.79.290, for each vessel of the system.

[Part III, § 10, filed 3/23/60.]

**WAC 296-104-150 Inspection of systems--Unfired steam boilers.** Unfired steam boilers operating at pressures of 50 psi or more shall be inspected as power boilers. Unfired steam boilers operating at less than 50 psi shall be inspected as unfired pressure vessels.

[Part III, § 11, filed 3/23/60.]

**WAC 296-104-155 Inspection of systems--Preparation for internal inspection.** The owner or user shall prepare a boiler for internal inspection in the following manner:

(a) Water shall be drawn off and the boiler thoroughly washed.

(b) All manhole and handhole plates and wash-out plugs and water column connections shall be removed, the furnace and combustion chambers thoroughly cooled and cleaned.

(c) All grates of internally fired boilers shall be removed.

(d) At each annual inspection brickwork shall be removed as required by the inspector in order to determine the condition of the boiler headers, furnace, supports, or other parts.

(e) The steam gage shall be removed for testing.

(f) Any leakage of steam or hot water into the boiler shall be cut off by disconnecting the pipe or valve at the most convenient point.

(g) The low water cutout shall be disassembled to such a degree as the inspector shall require.

[Part III, § 12, filed 3/23/60.]

**WAC 296-104-160 Inspection of systems--Boilers or unfired pressure vessels improperly prepared for inspection.** If a boiler or unfired pressure vessel has not been properly prepared for an internal inspection, or the owner or user fails to comply with the requirements for hydrostatic test as set forth in these rules, the inspector may decline to make the inspection or test and the certificate of inspection shall be withheld until the owner or user complies with the requirements.

Unfired pressure vessels shall be prepared for inspection to the extent deemed necessary by the inspector.

[Part III, § 13, filed 3/23/60.]

**WAC 296-104-165 Inspection of systems--Removal of covering to permit inspection.** If the boiler or unfired pressure vessel is jacketed so that the longitudinal seams of shells, drums, or domes cannot be seen, enough of the jacketing, setting wall, or other form of casing or housing shall be removed so that the size of the rivets, pitch of the rivets, and other data necessary to determine the safety of the boiler or unfired pressure vessel may be obtained provided such information cannot be determined by other means.

[Part III, § 14, filed 3/23/60.]

**WAC 296-104-170 Inspection of systems--Shop inspections.** Shop inspections shall be as outlined in the applicable sections of the ASME Code. Only inspectors holding a national board commission and a commission issued by the state of Washington shall make shop inspections in this state.

[Statutory Authority: RCW 70.79.030, 78-03-057 (Order 78-3), § 296-104-170, filed 2/22/78; Part III, § 15, filed 3/23/60.]

**WAC 296-104-200 Standards for new construction.** The standards for new construction are the ASME Boiler and Pressure Vessel Code, the 1980 edition of ANSI B31.3 for oil and chemical plants, and the 1983 edition of ANSI B31.1 for other nonnuclear construction, with all addenda as effectively made part of the above referenced ANSI sections of the codes. The last preceding code may be used on and after the date of issue and becomes mandatory twelve months after adoption by the board as defined in RCW 70.79.050(2). The board recognizes that the ASME Code states that new editions of the code become mandatory on issue and that subsequent addenda become mandatory six months after the date of issue. Also, in circumstances such as nuclear systems the time period for addenda becoming mandatory is defined in the Code of Federal Regulations.

[Statutory Authority: RCW 70.79.040 and 70.79.050, 86-01-088 (Order 85-26), § 296-104-200, filed 12/19/85. Statutory Authority: RCW 70.79.030 and 70.79.330, 84-11-016 (Order 84-09), § 296-104-200, filed 5/10/84; 82-24-025 (Order 82-36), § 296-104-200, filed 11/23/82, effective 1/1/83. Statutory Authority: RCW 70.79.030, 82-05-003 (Order 82-2), § 296-104-200, filed 2/4/82; 81-12-012 (Order 81-10), § 296-104-200, filed 5/28/81; 81-01-114 (Order 80-28), § 296-104-200, filed 12/24/80; 80-05-065 (Order 80-7), § 296-104-200, filed 4/23/80; 79-05-054 (Order 79-7), § 296-104-200, filed 4/30/79; 78-10-096 (Order 78-19), § 296-104-200, filed 10/3/78; Order 77-23, § 296-104-200, filed 11/8/77; Order 77-9, § 296-104-200, filed 5/26/77; Order 75-35, § 296-104-200, filed 10/29/75; Order 74-37, § 296-104-200, filed 11/8/74; Order 73-1, §

296-104-200, filed 3/22/73; Order 72-17, § 296-104-200, filed 9/28/72; Order 72-11, § 296-104-200, filed 7/7/72; Part IV, § 1, filed 3/23/60.]

**WAC 296-104-205 Inspection of systems--Non-standard regulations.** Those boilers and unfired pressure vessels that are not considered to be within the jurisdiction of the ASME Code and those of special design and construction require a special certificate, section VIII, U-1, and section 1, power boilers preamble of the ASME Code.

[Part IV, § 2, filed 3/23/60.]

**WAC 296-104-210 Inspection of systems--Special designs.** Prints and calculations shall be supplied for special designs or construction. Upon approval a Washington special number will be assigned by the chief inspector. The installation will be subject to the regular annual inspection in the case of boilers, and biennial inspection in the case of unfired pressure vessels.

[Statutory Authority: RCW 70.79.040 and 70.79.050, 86-07-064 (Order 86-02), § 296-104-210, filed 3/19/86; Order 73-1, § 296-104-210, filed 3/22/73; Part IV, § 3, filed 3/23/60.]

**WAC 296-104-215 Inspection of systems--Non-standard boilers and unfired pressure vessels.** Nonstandard boilers and unfired pressure vessels may be used provided they have not been moved from their original setting since January 1, 1952, or ownership has not changed since January 1, 1952.

[Part IV, § 4, filed 3/23/60.]

**WAC 296-104-220 Inspection of systems--Non-standard second hand boilers or unfired pressure vessels.** Nonstandard second hand boilers or unfired pressure vessels cannot be used in this state.

[Statutory Authority: RCW 70.79.240, 88-01-064 (Order 87-25), § 296-104-220, filed 12/17/87; Part IV, § 5, filed 3/23/60.]

**WAC 296-104-225 Inspection of systems--Reinstalled boiler or unfired pressure vessel.** In any case where a stationary boiler or unfired pressure vessel is moved and reinstalled, the fittings and appliances must comply with the latest edition of the ASME Code.

[Part IV, § 6, filed 3/23/60.]

**WAC 296-104-230 Inspection of systems--Hot water supply boilers and tanks.** Hot water supply boilers and tanks for operation below all of the following limitations; 200,000 btu input, 200°F. temperature, 160 psi pressure, and 120 gal. capacity, shall be tested as follows:

One boiler or tank of each design and size taken from the manufacturer's stock at random, shall be subjected to a hydrostatic test in the presence of an inspector holding a national board commission. The boiler or tank shall withstand a pressure of 300 psi without leaks or excessive distortion. Samples shall be taken from the longitudinal seam and tests made as outlined in Section IX ASME Code for root and face bends and reduced tensile coupons. Upon successfully passing the above

tests, a maximum allowable working pressure of 150 psi will be allowed for all boilers or tanks constructed to identical specifications. The company name, serial number, working pressure, and energy input shall be stamped or marked in a permanent manner on each boiler or tank. A retest shall be made at the inspector's discretion or by the request of the chief inspector. Hot water supply boilers or tanks for operation exceeding any of the above limitations shall be constructed in accordance with the ASME Code.

[Order 74-37, § 296-104-230, filed 11/8/74; Part IV, § 7, filed 3/23/60.]

**WAC 296-104-235 Inspection of systems--Safety relief valves.** The boilers and tanks covered by WAC 296-104-230 shall be protected by the installation of ASME Code relief valves with trial levers, set pressure not to exceed 160 psi. Relief valves shall be installed on top of tank or on outlet piping as close as possible to the boiler or tank, with a minimum of fittings and no valves intervening. The outlet of the relief valve shall be run full size to a safe place.

[Statutory Authority: RCW 70.79.030, 78-03-057 (Order 78-3), § 296-104-235, filed 2/22/78; Part IV, § 8, filed 3/23/60.]

**WAC 296-104-240 Inspection of systems--Unfired pressure vessels fabricated of pipe or pipe fittings.** Pressure vessels may be constructed of pipe or pipe fittings, the material complying with the specifications in the applicable sections of the ASME Code. When the part has significant duties other than transportation of a liquid, gas, or other material, such as storage, catch basin, scrubber, snubber, absorber, or pulsating dampener, it shall be deemed to be an unfired pressure vessel and shall conform to the rules governing the design, construction, inspection, and stamping of unfired pressure vessels.

[Part IV, § 9, filed 3/23/60.]

**WAC 296-104-245 Inspection of systems--Oil heaters.** Steam or hot water oil heaters shall be so designed and constructed that in the event of failure of any part, oil cannot enter the boiler water.

[Statutory Authority: RCW 70.79.030, 78-03-057 (Order 78-3), § 296-104-245, filed 2/22/78; Part IV, § 10, filed 3/23/60.]

**WAC 296-104-255 Inspection of systems--Clearance at top of boilers.** When boilers are replaced or new boilers installed in either existing or new buildings, a minimum clearance as specified below shall be provided between the top of boiler proper and ceiling:

(1) Power boilers having a steam generating capacity in excess of 5,000 pounds per hour or having a heating surface in excess of 1,000 sq. ft. or input in excess of 5,000,000 btu per hour. Clearance shall be . . . . . 7 feet.

(2) Low pressure boilers which exceed any one of the following limits: 5,000,000 btu input; 5,000 lbs. steam per hour capacity or 1,000 sq. ft. heating surface; and power



boilers which do not exceed any of the following limits: 5,000,000 btu input; 5,000 lbs. steam per hour capacity or 1,000 sq. ft. heating surface; and all boilers with manholes on top of boiler except those described in paragraph (1) above . . . . . 3 feet.

(3) Low pressure boilers which do not exceed the above limits and miniature boilers . . . . . 2 feet.

[Part IV, § 12, filed 3/23/60.]

**WAC 296-104-260 Inspection of systems--Clearance front, back and sides.** When boilers are replaced or new boilers installed in either existing or new buildings, minimum clearance shall be provided as specified below:

(1) Minimum clearance at sides and back wall shall be one and one-half feet or at the discretion of the inspector the manufacturers recommended clearances may be used if they allow sufficient room for inspection. Boilers having manholes shall have five feet clearance from the manhole opening and any wall, ceiling, or piping that will prevent a person from entering the boiler.

(2) Clearance in front and back shall be sufficient for operation, maintenance, and repair.

[Statutory Authority: Chapter 70.79 RCW. 89-15-025 (Order 89-05), § 296-104-260, filed 7/13/89, effective 8/13/89; Part IV, § 13, filed 3/23/60.]

**WAC 296-104-265 Inspection of systems--Control and limit devices.** All automatically fired steam, vapor, or hot water boilers excepting boilers having a constant attendant who has no other duties while the boiler is in operation, shall be equipped with an automatic low-water fuel cut-off and an automatic water feeding device. These may be incorporated in one body or may be separate devices. Designs embodying a float and float bowl shall have a vertical straight-away valve drain pipe at lowest point in the water equalizing pipe connection by which the bowl and equalizing pipe can be flushed and the device tested. Immersion units shall be designed so that they may be readily tested at frequent intervals. All boilers newly installed after June 1989 that are automatically fired low pressure steam heating boilers, small power boilers, and power steam boilers without a constant attendant who has no other duties shall be equipped with two high steam pressure limit controls, one of which shall be provided with a manual reset on the control with the highest setting, and two low-water fuel cut-offs, one of which shall be provided with a manual reset device and independent of the feed water controller. Coil type flash steam boilers may use two high-temperature limit controls, one of which shall be manually reset in the hot water coil section of the boiler instead of the low-water fuel cut-off. Control and limit devices shall be independently connected and electrically wired in series.

All automatically fired hot water supply, low-pressure hot water heating boilers, and power hot water boilers shall be equipped with two high-temperature limit controls, one of which shall be provided with a manual reset on the control with the highest setting, and one low-

water fuel cut-off with a manual reset and independent of the feed water controller. For coil type hot water boilers a low-water flow limit control installed in the circulating water line may be used instead of a low-water fuel cut-off. Control and limit devices shall be independently connected and electrically wired in series.

[Statutory Authority: RCW 70.79.240. 88-01-064 (Order 87-25), § 296-104-265, filed 12/17/87; Part IV, § 14, filed 3/23/60.]

**WAC 296-104-270 Inspection of systems--Explosion doors.** Explosion doors, if used and if located in setting walls within seven feet of the firing floor or operating platform shall be provided with substantial deflectors to divert the blast.

[Part IV, § 15, filed 3/23/60.]

**WAC 296-104-285 Unfired pressure vessels in places of public assembly.** Unfired pressure vessels in places of public assembly shall be exempt from the rules of this chapter when they do not exceed 1 1/2 cubic feet in volume and have a safety valve setting of 150 psi, or less; or when they are less than 6 inches in diameter, and do not exceed 5 cubic feet in volume regardless of pressure.

[Statutory Authority: RCW 70.79.030. 78-03-057 (Order 78-3), § 296-104-285, filed 2/22/78.]

**WAC 296-104-300 New installations--Ladders and runways.** When the boiler controls, valves, manholes, or casing openings are over ten feet from the fireroom floor, a fireproof runway or platform shall be provided, with handrails, at a convenient level for the purpose of affording safe access to the boiler. When runway or platform is more than twelve feet in extent, at least two means of exit shall be provided, each exit to be remotely located from the other. The provisions of this paragraph are mandatory for power boilers and are recommended for low pressure boilers.

[Part V, § 1, filed 3/23/60.]

**WAC 296-104-305 New installations--Exits from boiler rooms.** Boiler rooms containing a boiler or a combination of boilers of over 2,000 square feet of heating surface shall have two means of exit, each remotely located from the other. Each elevation shall have at least two means of egress, each remotely located from the other. At least one means of exit, in case of a difference in elevation, shall be by ramp or stairway of standard design.

[Part V, § 2, filed 3/23/60.]

**WAC 296-104-310 New installations--Discharge from safety valves, blow offs and drains.** The discharge from safety valves, blow offs and drains shall be located to prevent injury to personnel or property. The discharge from safety valves on boilers of 5,000 pounds of steam per hour capacity of single or multiple units shall be extended outside of building.

[Part V, § 3, filed 3/23/60.]



**WAC 296-104-320 New installations--Underground installations.** Where necessary to install a vessel underground, it shall be enclosed in a concrete or masonry pit with removable cover so that inspection of the entire shell and heads of the vessel can be made.

[Part V, § 5, filed 3/23/60]

**WAC 296-104-325 New installations--Supports.** Each boiler or unfired pressure vessel shall be supported by masonry or structural supports of sufficient strength and rigidity to safely support the vessel and its contents. There shall be no excessive vibration in either the vessel or its connecting piping.

[Part V, § 6, filed 3/23/60.]

**WAC 296-104-330 New installations--Pressure reducing valves.** (1) Where pressure reducing valves are used one or more relief or safety valves shall be provided on the low pressure side of the reducing valve in case the piping or equipment on the low pressure side does not meet the requirement for the full initial pressure. The relief or safety valves shall be located adjoining to or as close as possible to the reducing valve. Proper protection shall be provided to prevent injury or damage caused by the escaping steam from the discharge of relief or safety valves if vented to the atmosphere. The combined discharge capacity of the relief valves shall be such that the pressure rating of the lower pressure piping or equipment shall not be exceeded in case the reducing valve sticks open.

(2) The use of hand-controlled bypasses around reducing valves is permissible. The bypass if used around a reducing valve shall not be greater in capacity than the reducing valve unless the piping or equipment is adequately protected by relief valves or meets the requirements of the high pressure system. It is mandatory that a pressure gauge as well as a relief valve be installed on the low pressure side of a reducing valve.

[Part V, § 7, filed 3/23/60.]

**WAC 296-104-400 Existing installations--Stamping of existing boilers and unfired pressure vessels.** Each existing boiler and unfired pressure vessel shall be identified by a serial number of the state of Washington. The number will be assigned by the chief inspector and applied by an authorized inspector. The stamping shall be kept free of paint and lagging so that it will be plainly visible and easily read by the inspectors. Stamp shall be as outlined in WAC 296-104-060.

[Part VI, § 1, filed 3/23/60.]

**WAC 296-104-405 Existing installations--Existing boiler or unfired pressure vessels.** The maximum allowable working pressure shall be determined by the following formula:

$$\frac{TS \times t \times E}{R \times FS} = M A W P$$

(1989 Ed.)

TS = as given in ASME Code, when material cannot be identified use 55,000 for steel and 45,000 for wrought iron.

t = the thinnest part determined by actual measurement.

E = efficiency of longitudinal joint or ligament, whichever is the least, determined by the rules and formula in the ASME Code.

R = radius of largest course in inches.

FS = the minimum for boilers shall be 5; for reinstalled or second hand boilers, 6; for boilers with longitudinal lap seams, 8 (age limit for such boilers 30 years, may then be used at 15 psi provided they can otherwise pass inspection).

The minimum for unfired pressure vessels shall be 4 when less than 20 years old, 4 1/2 when over 20 years old.

[Part VI, § 2, filed 3/23/60.]

**WAC 296-104-410 Existing installations--Noncode steel heating boilers.** The maximum allowable working pressure for noncode steel heating boilers shall be 15 psi steam. For hot water service the allowable working pressure shall be computed from the formula in WAC 296-104-405, maximum 160 psi.

[Part VI, § 3, filed 3/23/60.]

**WAC 296-104-415 Existing installations--Noncode cast iron boilers.** The maximum allowable working pressure for noncode cast iron boilers shall be 15 psi steam or 30 psi water.

[Part VI, § 4, filed 3/23/60.]

**WAC 296-104-500 Nonnuclear repairs.** Where a repair, involving welding to a pressure retaining part is performed, an R-1 report, signed by the certificate holder and an authorized inspector shall be submitted to the jurisdiction, as required in the National Board Inspection Code. Repairs to all boilers, pressure vessels, and their appurtenances shall conform to the rules contained in the National Board Inspection Code wherever they apply. Furthermore, repairs shall be performed only by those holding an ASME Certificate of Authorization or a National Board "R" Certificate of Authorization. In all cases the material and workmanship shall comply with the rules contained in the appropriate sections of the ASME Code.

[Statutory Authority: RCW 70.79.030. 86-04-059 (Order 86-01), § 296-104-500, filed 2/4/86. Statutory Authority: RCW 70.79.030 and 70.79.330. 84-21-012 (Order 84-20), § 296-104-500, filed 10/5/84; Part VII, § 1, filed 3/23/60.]

**WAC 296-104-501 Nonnuclear alterations.** Where alterations are accomplished, copies of all R.1 alteration reports shall be sent to the department. Alterations to all boilers, pressure vessels, and their appurtenances shall conform to the rules contained in the National Board Inspection Code wherever they apply. Physical alterations shall only be performed by those parties with the appropriate ASME authorization.

[Title 296 WAC--p 1783]

[Statutory Authority: RCW 70.79.030. 86-04-059 (Order 86-01), § 296-104-501, filed 2/4/86.]

**WAC 296-104-505 Repairs--Repairs by fusion welding.** When repairs are to be made wherein fusion welding is to be used, permission shall be obtained from the chief inspector, a deputy inspector, or a special inspector and the welding shall be done in accordance with the rules given in the applicable sections of the ASME Code.

[Part VII, § 2, filed 3/23/60.]

**WAC 296-104-510 Repairs--Riveted patches.** In applying riveted patches the design of the patch and method of installation is subject to approval of the inspector.

[Part VII, § 3, filed 3/23/60.]

**WAC 296-104-515 Nonnuclear repairs--Safety devices.** All boilers and pressure vessels shall be safeguarded by safety valves, safety relief valves, or rupture discs, as specified in the ASME Code.

The resetting, repairing, and restamping of safety valves and relief valves shall be done by a qualified manufacturer or valve repair organization holding a valid "V," "UV," or "VR" Certificate of Authorization issued by the National Board of Boiler and Pressure Vessel Inspectors. Section IV safety valves shall be repaired only by the valve manufacturer. Boiler and pressure vessel users, however, may authorize external adjustments to be made to bring their installed safety valves and relief valves, except Section IV safety valves, back to the stamped set pressure. This adjustment shall be witnessed and approved by a National Board Commissioned Inspector. All such external adjustments shall be resealed showing the identification of the organization making the adjustments and the date.

Repairing of noncode relief or safety valves shall not be allowed, except as specified below. Noncode liquid relief valves installed prior to 1-1-85 shall be repaired by an organization holding a valid "V," "UV," or "VR" Certificate of Authorization, but need not be stamped.

[Statutory Authority: RCW 70.79.030. 86-04-059 (Order 86-01), § 296-104-515, filed 2/4/86. Statutory Authority: RCW 70.79.030 and 70.79.330. 84-21-012 (Order 84-20), § 296-104-515, filed 10/5/84; Part VII, § 4, filed 3/23/60.]

**WAC 296-104-520 Repairs--Lap seam crack.** The shell or drum of a boiler or unfired pressure vessel in which a lap seam crack is discovered along a longitudinal riveted joint shall be immediately discontinued from use. If the boiler or unfired pressure vessel is not more than 15 years of age, a complete new course of the original thickness may be installed at the discretion of the inspector (and after approval of the chief inspector). Patching is prohibited. By "lap seam crack" is meant the typical crack frequently found in lap seams, extending parallel to the longitudinal joint and located either between or adjacent to rivet holes.

[Part VII, § 5, filed 3/23/60.]

[Title 296 WAC—p 1784]

**WAC 296-104-525 Repairs--Hydrostatic pressure tests.** (1) A hydrostatic pressure test, when applied to boilers or unfired pressure vessels of riveted or welded construction, shall not exceed one and one-half times the maximum allowable working pressure. During the hydrostatic pressure test, the safety valve or valves shall be removed or each valve disc shall be held down by a testing clamp and not by applying additional load to the spring with the compression screw. It is suggested that the minimum temperature of the water used to apply a hydrostatic test be not less than 70°F., but the maximum temperature shall not exceed 160°F.

(2) Note: When hydrostatic test is to be applied to existing installations the pressure shall be as follows:

(a) For all cases involving the question of tightness the pressure shall be equal to the release pressure of the safety valve or valves having the highest release setting.

(b) For all cases involving the question of safety, the pressure shall be equal to one and one-half times the maximum allowable working pressure.

[Part VII, § 6, filed 3/23/60.]

**WAC 296-104-530 Repairs--Air or vapor testing.** Testing by air or vapor at pressures in excess of 15 lbs. shall not be undertaken without special permission.

[Part VII, § 7, filed 3/23/60.]

**WAC 296-104-600 General requirements--Conditions not covered by these rules.** (1) In any condition not covered by these rules, the latest edition of the ASME Code for design, construction, and installation shall apply.

(2) Should any section, subsection, sentence, clause, phrase, provision or exemption of these rules be declared unconstitutional or invalid for any reason, such invalidity shall not affect the remaining portion or provisions hereof.

[Part VIII, § 1, filed 3/23/60.]

**WAC 296-104-700 Inspection fees--Certificate fees--Expenses.** The following fees shall be paid by, or on behalf of, the owner or user upon the completion of the inspection. The inspection fees apply to inspections made by inspectors employed by the state.

Heating boilers:	Internal External	
	Cast iron--All sizes	25.00
All other boilers less than 500 sq. ft.	30.00	20.00
500 sq. ft. to 2500 sq. ft.	50.00	25.00
Each additional 2500 sq. ft. of total heating surface, or any portion thereof	20.00	10.00
Power boilers:	Internal External	
Less than 100 sq. ft.	25.00	20.00
100 sq. ft. to less than 500 sq. ft.	30.00	20.00

(1989 Ed.)

500 sq. ft. to 2500 sq. ft.	50.00	25.00
Each additional 2500 sq. ft. of total heating surface, or any portion thereof	20.00	10.00

Pressure vessels:

Automatic utility hot water supply heaters per RCW 70.79.090		5.00
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All other pressure vessels:

Square feet shall be determined by multiplying the length of the shell by its diameter.

	Internal	External
Less than 15 sq. ft.	20.00	15.00
15 sq. ft. to less than 50 sq. ft.	30.00	15.00
50 sq. ft. to 100 sq. ft.	35.00	20.00
For each additional 100 sq. ft. or any portion thereof	10.00	5.00

Certificate of inspection fees: For objects inspected, the certificate of inspection fee is \$15.00 per object.

Nonnuclear shop inspections, field construction inspections, and special inspection services:

For each hour or part of an hour up to 8 hours	30.00
For each hour or part of an hour in excess of 8 hours	45.00

Nuclear shop inspections, nuclear field construction inspections, and nuclear triennial shop survey and audit:

For each hour or part of an hour up to 8 hours	45.00
For each hour or part of an hour in excess of 8 hours	70.00

Nonnuclear triennial shop survey and audit:

When state is authorized inspection agency:

For each hour or part of an hour up to 8 hours	30.00
For each hour or part of an hour in excess of 8 hours	45.00

When insurance company is authorized inspection agency:

For each hour or part of an hour up to 8 hours	45.00
For each hour or part of an hour in excess of 8 hours	70.00

Expenses shall include:

Travel time and mileage: The department shall charge for its inspectors' travel time from their offices to the inspection sites and return. The travel time shall be charged for at the same rate as that for the inspection, audit, or survey. The department shall also charge 20 cents per mile or the actual cost of purchased transportation. Hotel and meals: Actual cost.

Reinspection fee: Same as the fee for the previous inspection during which discrepancies were reported. The fee will be charged only if the discrepancies are not corrected before the reinspection. The fee shall not exceed \$25.00. Washington state specials: For each vessel to be considered by the board for a Washington state special certificate, a fee of \$300.00 must be paid to the department before the board meets to consider the vessel. The board may, at its discretion, prorate the fee when a number of vessels that are essentially the same are to be considered.

[Statutory Authority: RCW 70.79.030 and 70.79.330, 84-21-012 (Order 84-20), § 296-104-700, filed 10/5/84; 84-11-016 (Order 84-09), § 296-104-700, filed 5/10/84; 82-24-025 (Order 82-36), § 296-104-700, filed 11/23/82, effective 1/1/83; Order 77-23, § 296-104-700, filed 11/8/77; Emergency Order 77-22, § 296-104-700, filed 11/8/77.]

**WAC 296-104-701 Civil penalties.** (1) An owner, user, or operator of a boiler or pressure vessel that violates a provision of chapter 70.79 RCW, or of the rules adopted under that chapter, is liable for a civil penalty based on the following schedule.

Operating under pressure a boiler or pressure vessel which the department has condemned, has issued a red tag or has suspended the inspection certificate:

First offense	\$150.00
Second offense	\$300.00
Each additional offense	\$500.00

Each day of such unlawful operation shall be deemed a separate offense.

Operating under pressure a boiler or pressure vessel without a valid inspection certificate:

First offense	\$ 50.00
Second offense	\$100.00
Each additional offense	\$200.00

Each day of such unlawful operation shall be deemed a separate offense.

Installation of a boiler or pressure vessel without meeting prior filing requirements of WAC 296-104-020:

First offense	\$100.00
Second offense	\$200.00
Each additional offense	\$500.00

Performing a repair to a boiler or pressure vessel, involving welding to a pressure retaining part, without meeting requirements of WAC 296-104-500:

First offense	\$150.00
Second offense	\$300.00
Each additional offense	\$500.00

Performing an alteration to a boiler or pressure vessel without meeting requirements of WAC 296-104-501:

First offense	\$150.00
Second offense	\$300.00
Each additional offense	\$500.00

Performing resetting, repair or restamping of safety valves, safety relief valves, or rupture discs, without meeting requirements of WAC 296-104-515:

First offense .....	\$150.00
Second offense .....	\$300.00
Each additional offense ....	\$500.00

Failure of owner to notify chief inspector in case of accident which serves to render a boiler or unfired pressure vessel inoperative, as required by WAC 296-104-025:

Each offense .....	\$100.00
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Failure to comply with a noncompliance report requirement:

Within 90 days .....	\$100.00
Within 91-180 days .....	\$250.00
Within 181-270 days .....	\$400.00
Within 271-360 days .....	\$500.00

(2) The department shall by certified mail notify a person of its determination that the person has violated this section.

(3) Any person aggrieved by an order or act under the boiler and unfired pressure vessels law or under the rules and regulations may, within fifteen days after such order or act, appeal to the board of boiler rules.

(4) Each day that a violation occurs will be a separate offense. A violation will be a second or additional offense only if it occurs within one year from the first violation.

[Statutory Authority: Chapter 70.79 RCW. 87-12-003 (Order 87-10), § 296-104-701, filed 5/21/87.]

**WAC 296-104-800 Inspection of systems subject to radioactivity.** In any case where a pressure vessel is radioactively contaminated to a degree that would not allow entering for visual inspection alternative means of inspection will be allowed. The inspector and owner shall work out a program of nondestructive examination that shall ascertain the condition of the vessel to assure its integrity.

[Statutory Authority: RCW 70.79.240. 88-01-064 (Order 87-25), § 296-104-800, filed 12/17/87.]

**Chapter 296-115 WAC  
SAFETY REQUIREMENTS FOR PASSENGER  
VESSELS**

**WAC**

296-115-001	Foreword.
296-115-005	Scope and application.
296-115-010	Appeal of decisions.
296-115-015	Definitions applicable to all sections of this chapter.
296-115-025	Vessel inspection and licensing.
296-115-030	Master's examination and licensing.
296-115-035	Specific inspection requirements.
296-115-040	Construction and arrangement.
296-115-050	General requirements.
296-115-060	Operations.
296-115-070	Rules of navigation.
296-115-100	Violations and setting of penalties.
296-115-120	Annual fee schedule.

**WAC 296-115-001 Foreword.** This chapter is adopted to implement chapter 88.04 RCW as revised in 1979. The purpose of these rules is to set reasonable guidelines and requirements to provide for the safety and health of passengers and crew on board passenger vessels. It is intended that these rules will be at least as effective as the rules adopted by the United States Coast Guard. This chapter is therefore adopted in cooperation with the United States Coast Guard.

[Statutory Authority: RCW 49.17.040, 49.17.050, 49.17.240, chapters 42.30 and 43.22 RCW. 80-17-014 (Order 80-20), § 296-115-001, filed 11/13/80.]

**WAC 296-115-005 Scope and application.** (1) This chapter shall apply to vessels for hire that carry seven or more passengers when the vessels are operated in inland waters within the jurisdiction of the state of Washington. These rules shall not apply to vessels in the navigable waters of the United States subject to the jurisdiction of the United States Coast Guard.

(2) Pursuant to chapter 88.04 RCW, the director of the department of labor and industries shall administer this chapter. The director is authorized to use the services of the marine dock section to administer this chapter.

(3) All rules adopted by the United States Coast Guard pertaining to inland water passenger vessel service and navigation on inland waters shall be directly applicable and administered as a part of this chapter unless they conflict with specific provisions of this chapter or chapter 88.04 RCW.

(4) Special consideration. In applying the provisions of this section, the director may allow departures from the specific requirements when special circumstances or arrangements warrant such departures. (46 CFR 175.25-1)

[Statutory Authority: RCW 49.17.040, 49.17.050, 49.17.240, chapters 42.30 and 43.22 RCW. 80-17-014 (Order 80-20), § 296-115-005, filed 11/13/80.]

**WAC 296-115-010 Appeal of decisions.** (1) Any person aggrieved by a decision of the marine dock section may appeal the decision to the director within twenty working days after receipt of the decision.

(2) The director shall give the chief of the marine dock section notice of the appeal and shall give the chief ten working days to comment in writing. At the discretion of the director, an informal conference may be held with all affected parties invited to participate.

(3) The director shall issue a determining order within twenty working days of the receipt of the appeal or within ten working days following conclusion of an informal conference.

[Statutory Authority: RCW 49.17.040, 49.17.050, 49.17.240, chapters 42.30 and 43.22 RCW. 80-17-014 (Order 80-20), § 296-115-010, filed 11/13/80.]

**WAC 296-115-015 Definitions applicable to all sections of this chapter.**

Note: Meaning of words. Unless the context indicates otherwise, words used in this chapter shall have the meaning given in this section.

(1) "Approved" – approved by the director; however, if a provision of this chapter states that approval by an agency or organization other than the department such as Underwriters' Laboratories or the United States Coast Guard is required, then approval by the specified authority shall be accepted.

(2) "Authorized person" – a person approved or assigned by the employer to perform a specific type of duty or duties or be at a specific location or locations at the workplace.

(3) "Competent person" – one who is capable of identifying existing and predictable hazards in the surroundings or working conditions that are unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt action to eliminate them.

(4) "Confined or enclosed space" – any space having a limited means of egress that is subject to the accumulation of toxic or flammable contaminants or has an oxygen deficient atmosphere. Confined or enclosed spaces include, but are not limited to, storage tanks, process vessels, bins, boilers, ventilation or exhaust ducts, tunnels, pipelines and open top spaces more than four feet in depth, such as pits, tubs, vaults, and vessels.

(5) "Defect" – any characteristic or condition that tends to weaken or reduce the strength of the tool, object, or structure of which it is a part.

(6) "Department" – the department of labor and industries.

(7) "Director" – the director of the department of labor and industries, or his designated representative.

(8) "Employer" – any person, firm, corporation, partnership, business trust, legal representative, or other business entity that operates a passenger vessel for hire in this state and employs one or more employees or contracts with one or more persons, the essence of which is the personal labor of such persons. Any person, partnership, or business entity that has no employees, and is covered by the Industrial Insurance Act shall be considered both an employer and an employee.

(9) "Equipment" – all machinery, devices, tools, facilities, safeguards, and protective construction used with construction operations.

(10) "Hazard" – a condition, potential or inherent, that is likely to cause injury, death, or occupational disease.

(11) "Hazardous substance" – a substance that, because it is explosive, flammable, poisonous, corrosive, oxidizing, irritating, or otherwise harmful, is likely to cause death or injury, including all substances listed on the USCG hazardous materials list.

(12) "Inspection" – the examination of vessels by the director or an authorized representative of the director.

(13) "Marine dock section" – the chief and staff of the marine dock section, department of labor and industries.

(14) "Passenger vessel" – a watercraft capable of carrying seven or more passengers for hire and licensed for such service.

(15) "Passenger for hire" – a person (other than master, crew or persons employed) who is carried aboard a vessel for valuable consideration whether directly or

indirectly flowing to the owner, charterer, agent or any other person interested in the vessel.

(16) "Port" – left hand side of a vessel as one faces the bow.

(17) "Starboard" – right hand side of a vessel as one faces the bow.

(18) "Steam vessel" – any vessel propelled by machinery.

(19) "Qualified" – one who, by possession of a recognized degree, certificate, or professional standing, or who by extensive knowledge, training, and experience, has successfully demonstrated the ability to solve problems relating to the subject matter, the work, or the project.

(20) "Safety factor" – the ratio of the ultimate breaking strength of a member or piece of material or equipment to the actual working stress or safe load when in use.

(21) "Safety and health standard" – a standard that requires the adoption or use of one or more practices, means, methods, operations, or processes reasonably necessary or appropriate to provide safe or healthful employment and places of employment.

(22) "Shall" – the provision of the standard is mandatory.

(23) "Should" – recommended.

(24) "Substantial" – constructed of such strength, of such material, and of such workmanship, that the object referred to will withstand all normal wear, shock, and usage.

(25) "Standard safeguard" – a device intended to remove a hazard incidental to the machine, appliance, tool, or equipment to which the device is attached.

Standard safeguards shall be constructed of either metal, wood, other suitable material, or a combination of these. The final determination of the sufficiency of any safeguard rests with the director .

(26) "Suitable" – that which fits, or has the qualities or qualifications to meet a given purpose, occasion, condition, function, or circumstance.

(27) "Under way" – a vessel is not at anchor, or made fast to the shore, or aground.

(28) "United States Coast Guard rules of navigation" – rules for inland waters, CG 323 and 169 as now adopted or hereafter legally amended by the United States Coast Guard. (46 CFR)

(29) "Working day" – a calendar day, except Saturdays, Sundays, and legal holidays as set forth in RCW 1.16.050, as now or hereafter amended. The time within which an act is to be done under the provisions of this chapter shall be computed by excluding the first working day and including the last working day.

(30) "Workman," "personnel," "man," "person," "employee," and other terms of like meaning, unless the context indicates otherwise – an employee of an employer who is employed in the business of his employer whether by way of manual labor or otherwise and every person in this state who is engaged in the employment of or who is working under an independent contract the essence of which is his personal labor for an employer whether by manual labor or otherwise.

(31) Abbreviations used in this chapter:

- (a) "CFR" – Code of Federal Regulations.
- (b) "USCG" – United States Coast Guard.

[Statutory Authority: RCW 49.17.040, 49.17.050, 49.17.240, chapters 42.30 and 43.22 RCW. 80-17-014 (Order 80-20), § 296-115-015, filed 11/13/80.]

**WAC 296-115-025 Vessel inspection and licensing.**

(1) The department shall inspect all vessels to ensure they are safe and seaworthy at least once each year. The department may also inspect a vessel if requested to do so by the owner, operator, or master of the vessel, and after an explosion, fire, or accident involving the vessel.

(2) The department may inspect a vessel upon receipt of a complaint from any person or, in the discretion of the department, at any other time.

(3) The department shall charge the owner of a vessel a fee for each inspection. This fee shall be determined by the director. (See WAC 296-115-120 for fee schedule.)

(4) After the department has inspected a vessel and it is satisfied the vessel is safe and seaworthy, the department shall issue a certificate of inspection for that vessel. The certificate shall be valid for one year after the date of inspection.

(5) The certificate shall set forth the date of the inspection, the names of the vessel and the owner, the number of lifeboats and life preservers required, the number of passengers allowed, and any other information the department may by rule require.

(6)(a) If at any time a vessel is found to be not safe or seaworthy, or not in compliance with the provisions of this chapter, the department may refuse to issue a certificate of inspection until the deficiencies have been corrected and may cancel any certificate of inspection currently issued.

(b) The department shall give the owner of the vessel a written statement of the reasons the vessel was found to be unsafe, unseaworthy, or not in compliance with the provisions of this chapter, including a specific reference to the statute or rule with which the vessel did not comply.

(7) An inspector of the department may, upon the presentation of his or her credentials to the owner, master, operator, or agent in charge of a vessel, board the vessel without delay to make an inspection. The inspector shall inform the owner, master, operator, or agent in charge that his or her intent is to inspect the vessel.

(8) During the inspection, the inspector shall have access to all areas of the vessel. The inspector may question privately the owner, master, operator, or agent in charge of the vessel, or any crew member of or passenger on the vessel.

(9) If any person refuses to allow an inspector to board a vessel for an inspection, or refuses to allow access to any areas of the vessel, the department may request a warrant from the superior court for the county in which the vessel is located. The court shall grant the warrant:

(a) If there is evidence that the vessel has sustained a fire or an explosion or has been involved in an accident;

(b) If there is evidence that the vessel is not safe or seaworthy; or

(c) Upon a showing that the inspection furthers a general administrative plan for enforcing the safety requirements of the act.

(10) The owner or master of a vessel shall post the certificate of inspection behind glass in a conspicuous area of the vessel.

(11) No person shall operate a passenger vessel if the vessel does not have a valid certificate of inspection.

[Statutory Authority: RCW 49.17.040, 49.17.050, 49.17.240, chapters 42.30 and 43.22 RCW. 80-17-014 (Order 80-20), § 296-115-025, filed 11/13/80.]

**WAC 296-115-030 Master's examination and licensing.**

(1) The registered owner of passenger vessels or barges for hire is responsible to obtain an operator's license from the United States Coast Guard or the department for the master or operator of each vessel. A physical examination will be required.

(2) The department shall penalize any person who acts as a master or operator on a vessel without having first received a United States Coast Guard or department license, or without having a valid license in his or her possession, or upon a vessel or class of vessels not specified in the license.

(3) The department may recommend suspension or revocation of a license to the United States Coast Guard for intemperance, incompetency, or a negligent, reckless, or willful disregard for duty.

[Statutory Authority: Chapter 49.17 RCW. 89-21-018 (Order 89-10), § 296-115-030, filed 10/10/89, effective 11/24/89. Statutory Authority: RCW 49.17.040, 49.17.050, 49.17.240, chapters 42.30 and 43.22 RCW. 80-17-014 (Order 80-20), § 296-115-030, filed 11/13/80.]

**WAC 296-115-035 Specific inspection requirements.**

(1) Drydocking or hauling out. Each vessel subject to the provisions in this section shall be drydocked or hauled out at intervals not to exceed sixty months and the underwater hull and appendages, propellers, shafting, stern bearings, rudders, through-hull fittings, sea valves and strainers shall be examined to determine that these items are in satisfactory condition. Refer to 46 CFR 176.15.

(2) At the annual inspection the marine dock inspector shall view the vessel afloat and conduct the following tests and inspections of the hull:

(a) Hull exterior and interior, bulkheads, and weather deck.

(b) Examine and test by operation all watertight closures in the hull, decks, and bulkheads.

(c) Inspect all railings and bulwarks and their attachment to the hull.

(d) Inspect weathertight closures above the weather deck and drainage or water from exposed decks and superstructure. Refer to 46 CFR 176.25-5.

(3) At the annual inspection the marine dock inspector shall examine and test the following items:

(a) Main propulsion machinery.

(b) Engine starting system.

(c) Engine control mechanisms.

- (d) Auxiliary machinery.
- (e) Fuel systems.
- (f) Sea valves and bulkhead closure valves.
- (g) Bilge and drainage systems.
- (h) Electrical system, including circuit protection. Refer to 46 CFR 176.25-10 and 176.25-15.

(4) Lifesaving and fire extinguishing equipment. At each annual inspection the marine dock inspector shall inspect the life saving and fire extinguishing equipment for serviceability. Refer to 46 CFR 176.25-20 and 176.25-25.

(5) Miscellaneous systems and equipment. At each annual inspection the marine dock inspector shall inspect and test the vessel's steering apparatus, ground tackle, navigation lights, sanitary facilities, pressure vessels, and any other equipment aboard the vessel for serviceability and safety. Refer to 46 CFR 176.25-35, 176.25-40, and 176.25-45.

[Statutory Authority: RCW 49.17.040, 49.17.050, 49.17.240, chapters 42.30 and 43.22 RCW. 80-17-014 (Order 80-20), § 296-115-035, filed 11/13/80.]

#### **WAC 296-115-040 Construction and arrangement.**

##### **(1) Application.**

(a) The requirements of this section shall apply to all vessels contracted for construction on or after June 7, 1979.

(b) Vessels constructed before the effective date of this chapter shall be brought into substantial compliance with the requirements of this section. Where deviation exists and strict compliance is impractical, the director may grant a temporary variance to allow a modification or a permanent variance if the intent of subsection (1)(c) of this section is met.

(c) The intent of the regulations in this part is to provide for a sound, seaworthy vessel, reasonably fit for the service it is intended to provide, and to ensure that the materials, scantlings, fastenings, and workmanship meet this intent. Primary consideration shall be given to the provision of a seaworthy hull, protection against fire, means of escape in case of casualty, guards and rails in hazardous places, ventilation of closed spaces, and necessary facilities for passengers and crew.

##### **(2) Hull structure.**

(a) In general, compliance with the standards of the United States Coast Guard rules for small passenger vessels or with the standards of a recognized classification society will be considered satisfactory evidence of the structural adequacy of a vessel. Refer to 46 CFR 177.10.

(b) Special consideration will be given by the director to materials or structural requirements not contemplated by the standards of a recognized classification society.

##### **(3) Watertight integrity and subdivision.**

(a) All vessels carrying more than forty-nine passengers shall have a collision bulkhead and watertight bulkheads (or sufficient air tankage or other internal flotation) so the vessel will remain afloat (with positive stability) with any one main compartment flooded.

(b) All watertight bulkheads required by this part shall be of substantial construction so as to be able to remain watertight with water to the top of the bulkhead.

(c) Watertight bulkheads shall extend intact to the bulkhead deck. Penetrations shall be kept to a minimum and shall be watertight.

(d) The weather deck on a flush deck vessel shall be watertight and shall not obstruct overboard drainage.

(e) Cockpits shall be watertight except that companionways may be fitted if they are provided with watertight coamings and weathertight doors. Also, ventilation openings may be provided if they are situated as high in the cockpit as possible and the opening height does not exceed two inches.

(f) Cockpits shall be self-bailing. The scuppers installed for this purpose shall be located so as to be effective considering probable list and trim.

(g) Well decks shall be watertight. Freeing ports may be installed if the provisions of 46 CFR 178.30 are followed.

(h) On vessels operating on protected waters, hatches may be weathertight. All hatches shall be provided with covers capable of being secured.

(i) The number of openings in the vessel's sides below the weather deck shall be kept to a minimum.

(j) Any openings in a vessel's sides, such as portlights, shall comply with 46 CFR 178.40.

##### **(4) Stability.**

(a) All vessels subject to the provisions of this section shall have a stability test, except that the director may dispense with the requirements for a test if he deems that a test is not required, on the basis of sufficient evidence provided by the owner that the vessel's stability is satisfactory for the service for which it is intended. Refer to 46 CFR 179.05-1.

(b) A letter stating that the vessel has met the stability requirements of this part shall be posted in the pilot-house of each vessel. Refer to 46 CFR 179.20.

[Statutory Authority: RCW 49.17.040, 49.17.050, 49.17.240, chapters 42.30 and 43.22 RCW. 80-17-014 (Order 80-20), § 296-115-040, filed 11/13/80.]

#### **WAC 296-115-050 General requirements. (1) Application.**

(a) The following rules are applicable to all vessels operated within the scope of this chapter.

(b) Where an existing vessel does not comply with a particular requirement of this section, the director may grant a temporary variance to allow time for modifications to be made.

(c) Where an existing vessel does not exactly comply with a specific requirement contained herein but the degree of protection afforded is judged to be adequate for the service in which the vessel is used, the director may grant a permanent variance.

(2) Lifesaving equipment. Where equipment required by this section is required to be of an approved type, the equipment is required to be approved by the USCG. Refer to 46 CFR 180.05.

(3) Lifesaving equipment required.



(a) All vessels carrying passengers shall carry life floats or buoyant apparatus for all persons on board.

(b) All life floats or buoyant apparatus shall be international orange in color.

(c) In the case of vessels operating not more than one mile from land, the director may permit operation with reduced amounts of life floats or buoyant apparatus, when, in his opinion, it is safe to do so.

(d) Lifeboats, life rafts, dinghies, dories, skiffs, or similar type craft maybe substituted for the required life floats or buoyant apparatus if the substitution is approved by the director.

(e) Life floats, buoyant apparatus, or any authorized substitute shall have the following equipment:

(i) A life line around the sides at least equivalent to 3/8-inch manila, festooned in bights of at least three feet, with a seine float in the center of each bight.

(ii) Two paddles or oars not less than four feet in length.

(iii) A painter of at least thirty feet in length and of at least two-inch manila or the equivalent. Refer to 46 CFR 180.10.

(f) All vessels shall have an approved adult type life preserver for each person carried, with at least ten percent additional of a type suitable for children.

(g) Life preservers shall be stowed in readily accessible places in the upper part of the vessel, and each life preserver shall be marked with the vessel's name. Refer to 46 CFR 180.25.

(h) All vessels shall carry at least one life ring buoy of an approved type with sixty feet of line attached.

(i) The life ring buoy shall be carried in a readily accessible location and shall be capable of being cast loose at any time. Refer to 46 CFR 180.30.

#### (4) Fire protection.

(a) The general construction of a vessel shall minimize fire hazards. Refer to 46 CFR 177.10-5.

(b) Internal combustion engine exhausts, boiler and galley uptakes, and similar sources of ignition shall be kept clear of and suitably insulated from woodwork or other combustible material.

(c) Lamp, paint, and oil lockers and similar storage areas for flammable or combustible liquids shall be constructed of metal or lined with metal.

(5) Fire protection equipment. Equipment required by this section, when required to be of an approved type, shall be of a type approved by the USCG or other agency acceptable to the director. Refer to 46 CFR 181.05.

#### (6) Fire pumps.

(a) All vessels carrying more than forty-nine passengers shall carry an approved power fire pump, and all other vessels shall carry an approved hand fire pump. These pumps shall be provided with a suitable suction and discharge hose. These pumps may also serve as bilge pumps.

(b) Vessels required to have a power fire pump shall also have a fire main system, including fire main, hydrants, hose, and nozzles. The fire hose may be a good commercial grade garden hose of not less than 5/8 inch size. Refer to 46 CFR 181.10.

#### (7) Fixed fire extinguishing system.

(a) All vessels powered by internal combustion engines using gasoline or other fuel having a flashpoint of 110°F or lower, shall have a fixed fire extinguishing system to protect the machinery and fuel tank spaces.

(b) This system shall be an approved type using carbon dioxide and have a capacity sufficient to protect the space.

(c) Controls for the fixed system shall be installed in an accessible location outside the space protected. Refer to 46 CFR 181.20.

(8) Fire axe. All vessels shall have one fire axe located in or near the pilothouse. Refer to 46 CFR 181.35-1.

#### (9) Portable fire extinguishers.

(a) All vessels shall have a minimum number of portable fire extinguishers of an approved type. The number required shall be determined by the director.

(b) Portable fire extinguishers shall be inspected at least once a month. Extinguishers found defective shall be serviced or replaced.

(c) Portable fire extinguishers shall be serviced at least once a year. The required service shall consist of discharging and recharging foam and dry chemical extinguishers and weighing and inspecting carbon dioxide extinguishers.

(d) Portable fire extinguishers shall be hydrostatically tested at intervals not to exceed those specified in WAC 296-24-59007 (4)(c) and Table L-3.

(e) Portable fire extinguishers of the vaporizing liquid type such as carbon tetrachloride and other toxic vaporizing liquids are prohibited and shall not be carried on any vessel.

(f) Portable fire extinguishers shall be mounted in brackets or hangers near the space protected. The location shall be marked in a manner satisfactory to the director. Refer to 46 CFR 181.30.

#### (10) Means of escape.

(a) Except as otherwise provided in this section, all vessels shall be provided with not less than two avenues of escape from all general areas accessible to the passengers or where the crew may be quartered or normally employed. The avenues shall be located so that if one is not available the other may be. At least one of the avenues should be independent of watertight doors.

(b) Where the length of the compartment is less than twelve feet, one vertical means of escape will be acceptable under the following conditions:

(i) There is no source of fire in the space, such as a galley stove or heater and the vertical escape is remote from the engine and fuel tank space; or

(ii) The arrangement is such that the installation of two means of escape does not materially improve the safety of the vessel or those aboard.

#### (11) Ventilation.

(a) All enclosed spaces within the vessel shall be properly vented or ventilated. Where such openings would endanger the vessel under adverse weather conditions, means shall be provided to close them.

(b) All crew and passenger space shall be adequately ventilated in a manner suitable to the purpose of the space. Refer to 46 CFR 117.20-5.

(12) Crew and passenger accommodations.

(a) Vessels with crew members living aboard shall have suitable accommodations.

(b) Vessels carrying passengers shall have fixed seating for the maximum number of passengers permitted to be carried.

(c) Fixed seating shall be installed with spacing to provide for ready escape in case of fire or other casualty.

(d) Fixed seating shall be installed as follows, except that special consideration may be given by the director if escape over the side can be readily through windows or other openings in the way of the seats:

(i) Aisles not over fifteen feet long shall be not less than twenty-four inches wide.

(ii) Aisles over fifteen feet long shall be not less than thirty inches wide.

(iii) Where seats are in rows the distance from seat front to seat front shall be not less than thirty inches.

(e) Portable or temporary seating may be installed but shall be arranged in general as provided for fixed seating. Refer to 46 CFR 177.25 and 177.30.

(13) Toilet facilities and drinking water.

(a) Vessels shall be provided with toilets and wash basins as specified in WAC 296-24-12007 and 296-24-12009, except that in the case of vessels used exclusively on short runs of approximately thirty minutes or less, the director may approve other arrangements.

(b) All toilets and wash basins shall be fitted with adequate plumbing. Facilities for men and women shall be in separate compartments, except in the case of vessels carrying forty-nine passengers and less, the director may approve other arrangements.

(c) Potable drinking water shall be provided for all passengers and crew. The provisions of WAC 296-24-12005 shall apply.

(d) Covered trash containers shall be provided in passenger areas. Refer to 46 CFR 177.30-5 and 7.

(14) Rails and guards.

(a) Except as otherwise provided in this section, rails or equivalent protection shall be installed near the periphery of all weather decks accessible to passengers and crews. Where space limitations make deck rails impractical, such as at narrow catwalks in the way of deckhouse sides, hand grabs may be substituted.

(b) Rails shall consist of evenly spaced courses. The spacing shall not be greater than twelve inches except as provided in subdivision (f) of this subsection. The lower rail courses may not be required where all or part of the space below the upper rail course is fitted with a bulwark, chain link fencing, wire mesh or the equivalent.

(c) On passenger decks of vessels engaged in ferry or excursion type operation, rails shall be at least forty-two inches high. The top rail shall be pipe, wire, chain, or wood and shall withstand at least two hundred pounds of side loading. The space below the top rail shall be fitted with bulwarks, chain link fencing, wire mesh, or the equivalent.

(d) On vessels in other than passenger service, the rails shall be not less than thirty-six inches high, except

that where vessels are used in special service, the director may approve other arrangements, but in no case less than thirty inches.

(e) Suitable storm rails or hand grabs shall be installed where necessary in all passageways, at deckhouse sides, and at ladders and hatches where passengers or crew might have normal access.

(f) Suitable covers, guards, or rails shall be installed in the way of all exposed and hazardous places such as gears or machinery. (See WAC 296-24-150 for detailed requirements.) Refer to 46 CFR 177.3.

(15) Machinery installation. (Refer to 46 CFR 182.)

(a) Propulsion machinery. (Refer to 46 CFR 182.05.)

(i) Propulsion machinery shall be suitable in type and design for the propulsion requirements of the hull in which it is installed. Installations meeting the requirements of the USCG or other classification society will be considered acceptable to the director.

(ii) Installations using gasoline as a fuel shall meet the requirements of 46 CFR 182.15.

(iii) Installations using diesel fuel shall meet the requirements of 46 CFR 182.20.

(b) Auxiliary machinery and bilge systems. (Refer to 46 CFR 182.10 and 182.25.)

(i) All vessels shall be provided with a suitable bilge pump, piping and valves for removing water from the vessel.

(ii) Vessels carrying more than forty-nine passengers shall have a power operated bilge pump. The source of power shall be independent of the propulsion machinery. Other vessels shall have a hand operated bilge pump, but may have a power operated pump if it is operated by an independent power source.

(c) Steering apparatus and miscellaneous systems. (Refer to 46 CFR 182.30.)

(i) All vessels shall be provided with a suitable steering apparatus.

(ii) All vessels shall be provided with navigation lights and shapes, whistles, fog horns, and fog bells as required by law and regulation.

(iii) All vessels shall be equipped with a suitable number of portable battery lights.

(d) Electrical installations. The electrical installations of all vessels shall be at least equal to 46 CFR 183, or as approved by the director.

[Statutory Authority: RCW 49.17.040, 49.17.050, 49.17.240, chapters 42.30 and 43.22 RCW. 80-17-014 (Order 80-20), § 296-115-050, filed 11/13/80.]

**WAC 296-115-060 Operations.** (1) This section shall apply to all passenger vessel operations within the scope of this chapter.

(2) Notice of casualty. (Refer to 46 CFR 185.15.)

(a) The owner or person in charge of any vessel involved in a marine accident or casualty involving any of the following shall report the incident immediately to the department.

(i) Damage to property in excess of one thousand five hundred dollars.

(ii) Major damage affecting the seaworthiness or safety of the vessel.

(iii) Loss of life or an injury to a person that incapacitates the person for more than seventy-two hours.

(b) The report shall be in writing to the director and upon receipt of the report the director may request an investigation by a marine dock inspector.

(3) Miscellaneous operating requirements. (Refer to 46 CFR 185.20.)

(a) In the case of collision, accident, or other casualty involving a vessel the operator, shall, so far as he can do so without serious danger to his own vessel or persons aboard, render any necessary assistance to other persons affected by the collision, accident, or casualty to save them from danger. He shall also give his name and address and the name of his vessel to any person injured and to the owner of any property damaged.

(b) The person in charge of the vessel shall see that the provisions of the certificate of inspection are strictly adhered to. This shall not be construed as limiting the person in charge from taking any action in an emergency that he deems necessary to help vessels in distress or to prevent loss of life.

(c) Persons operating vessels shall comply with the provisions of the USCG rules of the road for inland waters. (Refer to USCG publication 169.)

(d) The operator of a vessel shall test the vessel's steering gear, signaling whistle, controls, and communication system before getting under way for the day's operation.

(e) Vessels using fuel having a flashpoint of 110°F or lower shall not take on fuel when passengers are on board.

(f) All vessels shall enforce "no smoking" provisions when fueling. Locations on the vessel where flammable or combustible liquids are stored shall be posted "no smoking."

(g) All vessels shall prepare and post emergency check-off lists in a conspicuous place accessible to crew and passengers, covering the following:

- (i) Man overboard.
- (ii) Fire.

(h) The persons in charge shall conduct emergency drills to ensure that the crew is familiar with their duties in an emergency.

(i) The carriage of hazardous substances is prohibited on vessels. However, the director may authorize a vessel to carry specific types and quantities of hazardous substances if he deems it necessary.

(j) All areas accessible to passengers or crew shall be kept in a clean and sanitary condition. All walking surfaces shall be free of slipping or tripping hazards and in good repair.

(4) First-aid training. There shall be present or available on all passenger vessels, at all times, a person holding a valid certificate of first-aid training from the department of labor and industries, United States Bureau of Mines, or the American Red Cross, or equivalent training that can be verified by documentary evidence. A valid first-aid certificate is one that is less than three years old.

(5) First-aid equipment. A first-aid kit or first-aid room shall be provided on all passenger vessels. The size

and quantity of first-aid supplies or equipment required shall be determined by the number of persons normally dependent upon each kit or equipment. The first-aid kit or supplies shall be in a weatherproof container with individually sealed packages for each type of item. The first-aid station or kit location shall be posted on the container.

[Statutory Authority: RCW 49.17.040, 49.17.050, 49.17.240, chapters 42.30 and 43.22 RCW. 80-17-014 (Order 80-20), § 296-115-060, filed 11/13/80.]

**WAC 296-115-070 Rules of navigation.** (1) Application. The following rules shall be observed in navigating all steam vessels on the waters within the jurisdiction of the state, excepting the waters which are under the jurisdiction of the United States.

(2) When two steam vessels are meeting, end on, or nearly end on, so as to involve risk of collision, each shall alter her course to starboard, so that each may pass on the port side of the other.

(3) When two steam vessels are crossing so as to involve risk of collision, the vessel that has the other on her own starboard side shall keep out of the way of the other.

(4) When a steam vessel and a sailing vessel are proceeding in such directions as to involve risk of collision, the steam vessel shall keep out of the way of the sailing vessel.

(5) When, by any of these rules, one of two vessels is to keep out of the way, the other shall keep her course and speed.

(6) Every steam vessel, when approaching another steamboat or small boat or vessel of any kind, so as to involve the risk of collision, shall slacken her speed, or if necessary, shall stop and reverse her engine, and every steam vessel shall, when in a fog, go at a moderate speed.

(7) Any steam vessel overtaking another steam vessel shall keep out of the way of the overtaken steam vessel.

(8)(a) When steam vessels are running in the same direction, and the vessel that is astern desires to pass on the starboard hand of the vessel ahead, she shall give one short blast of the steam whistle, as a signal of the desire, and if the vessel ahead answers with one blast, she shall direct her course to starboard; or if she desires to pass on the port side of the vessel ahead, she shall give two short blasts of the steam whistle as a signal of the desire, and if the vessel ahead answers with two blasts, shall direct her course to port. If the vessel ahead does not think it safe for the vessel astern to attempt to pass at that point, she shall immediately signify it by giving several short and rapid blasts of the steam whistle, not less than four, and under no circumstances shall the vessel astern attempt to pass the vessel ahead until they have reached a point where it can be safely done, when the vessel ahead shall signify her willingness by blowing the proper signals. The vessel ahead shall in no case attempt to cross the bow or crowd upon the course of the passing vessel.

(b) Every vessel coming up with another vessel from any direction more than two points abaft her beam, that

is, in such a position with reference to the overtaken vessel that at night she would be unable to see either of that vessel's side lights, shall be deemed to be an overtaking vessel; and no subsequent alteration of the bearing between the two vessels shall make the overtaking vessel a crossing vessel within the meaning of the rules in this part, or relieve her of the duty of keeping clear of the overtaken vessel until she is finally past and clear.

(c) As by day the overtaking vessel cannot always know with certainty whether she is forward of or abaft this direction from the other vessel she should, if in doubt, assume that she is an overtaking vessel and keep out of the way.

(9)(a) When two steam vessels are approaching each other at right angles or obliquely so as to involve risk of collision, other than when one steam vessel is overtaking another, the steam vessel that has the other on her own port side shall hold her course and speed; and the steam vessel that has the other on her own starboard side shall keep out of the way of the other by directing her course to starboard so as to cross the stern of the other steam vessel or, if necessary to do so, slacken her speed, stop, or reverse.

(b) If from any cause the conditions covered by this situation prevent immediate compliance with each other's signals, the misunderstanding or objection shall be at once made apparent by blowing the danger signal, and both steam vessels shall be stopped and backed if necessary, until signals for passing with safety are made and understood.

(10) When two steam vessels are approaching each other, and if the courses of the steam vessels are so far on the starboard side of each as not to be considered by the operators as meeting end on, or nearly so, or if the steam vessels are approaching each other, in such manner that passing to the right as in subsection (2) of this section is deemed unsafe by the operator of either steam vessel, the operator first deciding shall give two short and distinct blasts on his steam whistle, which the operator of the other steam vessel shall answer promptly by two blasts of his steam whistle, and they shall pass on the starboard side of each other.

(11) When two steam vessels are approaching each other and the operator of either steam vessel fails to understand the course or intention of the other, whether from the signals being given, answered erroneously, or from other cause, the operator in doubt shall immediately signify it by giving several short and rapid blasts of the whistle, not less than four, and if the vessels have approached within five hundred yards of each other, both shall be immediately slowed to a speed barely sufficient for steerageway until the proper signals are given, answered and understood, or until the boats have passed each other.

(12) When a steam vessel is running in a fog or thick weather the operator shall give a long blast of the whistle at intervals not exceeding one minute.

(13) Distress signals. When a vessel is in distress and requires assistance from other vessels or from the shore the following signal shall be used or displayed by her, either together or separately.

(a) In the daytime – a continuous sounding with any fog-signal apparatus, or firing a gun.

(b) At night – flames on the vessel as from a burning tar barrel or oil barrel, a continuous sounding with any fog-signal apparatus, or firing a gun.

(14) In construing these provisions, due regard must be had to all the dangers of navigation, and to any special circumstances that may exist, rendering a departure from these provisions necessary to avoid immediate danger.

(15) Every steam vessel that is under sail and not under steam is to be considered a sailing vessel, and every vessel propelled by machinery, whether under sail or not, is to be considered a steam vessel.

(16) All steam vessels shall conform to and obey other rules and regulations prescribed by the United States Coast Guard that are not inconsistent with these rules.

(17) Lights. Every steam vessel, when navigating between sunset and sunrise, shall carry the following lights:

(a) At the foremast head, a bright white light that is visible, on a dark night with a clear atmosphere, for at least two miles; that shows a uniform and unbroken light over an arc of the horizon of twenty points of the compass; and that throws the light ten points on each side of the vessel from right ahead to two points abaft the beam on either side.

(b) On the starboard side a green light that is visible, on a dark night with a clear atmosphere, for at least two miles; that shows a uniform and unbroken light over an arc of the horizon of ten points of the compass; and that throws the light from right ahead to two points abaft the beam on the starboard side.

(c) On the port side a red light that is visible, on a dark night with a clear atmosphere, for at least two miles; that shows a uniform and unbroken light over an arc of the horizon of ten points of the compass; and that throws the light from right ahead to two points abaft the beam on the port side. The green and red lights shall be fitted with inboard screens, projecting at least three feet forward from the lights, to prevent them from being seen across the bow.

(d) A vessel when underway, if not otherwise required by these rules to carry one or more lights visible from aft, shall carry at her stern a white light that shows an unbroken light over an arc of the horizon of twelve points of the compass; that shows the light six points from right aft on each side of the vessel; and that is visible for at least two miles. The light shall be carried as nearly as practicable on the same level as the side lights.

[Statutory Authority: RCW 49.17.040, 49.17.050, 49.17.240, chapters 42.30 and 43.22 RCW. 80-17-014 (Order 80-20), § 296-115-070, filed 11/13/80.]

**WAC 296-115-100 Violations and setting of penalties.** (1) Violations of the mandatory provisions of this chapter shall be subject to penalty. The amount of the penalty will be assessed in accordance with the guidelines and fixed schedules contained herein.

(2) Fixed schedule penalties.

(a) Failure to display certificate of inspection as required: Fifty dollars to owner of the vessel.

(b) Operation of vessel in passenger service without a valid certificate of inspection: To owner of vessel, two hundred dollars per violation; to person who operates vessel, one hundred dollars per violation.

(c) Operation of vessel in passenger service while not in possession of valid USCG operator's license: One hundred dollars per violation to owner of vessel.

[Statutory Authority: RCW 49.17.040, 49.17.050, 49.17.240, chapters 42.30 and 43.22 RCW. 80-17-014 (Order 80-20), § 296-115-100, filed 11/13/80.]

**WAC 296-115-120 Annual fee schedule.** (1) The annual license fee for passenger vessels or barges is \$250.00 plus \$2.00 per ton for each vessel.

(2) The fee for an operator's license for passenger vessels or barges is \$50.00 for the first year; this covers application and test costs. The renewal fee is \$25.00 annually.

(3) Additional inspection service when required is at the rate of \$25.00 per hour, plus travel and per diem.

[Statutory Authority: Chapter 49.17 RCW. 89-21-018 (Order 89-10), § 296-115-120, filed 10/10/89, effective 11/24/89. Statutory Authority: RCW 49.17.040, 49.17.050, 49.17.240, chapters 42.30 and 43.22 RCW. 80-17-014 (Order 80-20), § 296-115-120, filed 11/13/80.]

## Chapter 296-116 WAC

### PILOTAGE RULES

#### WAC

296-116-010	Time and place of meeting.
296-116-020	Special meeting.
296-116-030	Emergency meeting.
296-116-050	Records.
296-116-060	Personnel.
296-116-070	Collection of fees.
296-116-075	Qualifications for pilot applicants.
296-116-080	Licensing of pilots.
296-116-081	Rest period.
296-116-082	Limitations on new pilots.
296-116-083	Examination review and appeal procedures.
296-116-085	Association bylaws.
296-116-110	Details and requirements of renewal application.
296-116-120	Physical requirements.
296-116-130	Period of incapacitation.
296-116-140	Limitations.
296-116-150	Registration of operators.
296-116-170	Pilotage station.
296-116-175	Tariff proposals.
296-116-185	Tariffs, and pilotage rates for the Grays Harbor pilotage district.
296-116-200	Duties of pilots.
296-116-205	Vessel certification.
296-116-2051	Vessel certification form.
296-116-300	Pilotage rates for the Puget Sound pilotage district.
296-116-35001	Exemption from provisions of WAC 197-10-800.
296-116-360	Exempt vessels.
296-116-370	System of specified disciplinary or corrective actions.
296-116-400	Procedure for request by steamship company or agent that certain pilots not be assigned to certain vessels for specific safety reasons.
296-116-410	Definition of Grays Harbor pilotage district.
296-116-420	Summary/temporary license suspension.

#### DISPOSITION OF SECTIONS FORMERLY CODIFIED IN THIS CHAPTER

296-116-040	Quorum defined. [Statutory Authority: RCW 88.16.035 and 88.16.155. 78-09-057 (Order 78-2, Resolution No. 78-2), § 296-116-040, filed 8/23/78; Order 2-68, § 296-116-040, filed 11/1/68; § 4, effective 11/25/58.] Repealed by 80-03-081 (Order 79-6, Resolution No. 79-6), filed 3/4/80. Statutory Authority: RCW 88.16.035.
296-116-090	Examination of pilots (Puget Sound and adjacent inland waters). [Order 76-12, § 296-116-090, filed 4/22/76; Order 74-33, § 296-116-090, filed 7/10/74; Order 69-4, § 296-116-090, filed 7/18/69; Order 2-68, § 296-116-090, filed 11/1/68; § 9, effective 11/25/58.] Repealed by 80-03-081 (Order 79-6, Resolution No. 79-6), filed 3/4/80. Statutory Authority: RCW 88.16.035.
296-116-095	Examination of pilots (Grays Harbor or Willapa Bay). [Order 76-12, § 296-116-095, filed 4/22/76; Order 73-6, § 296-116-095, filed 5/11/73; Order 2-68, § 296-116-095, filed 11/1/68; Rule 2-67 (part), filed 8/3/67, effective 9/5/67; Emergency Rule 1-67, filed 6/8/67.] Repealed by 80-03-081 (Order 79-6, Resolution No. 79-6), filed 3/4/80. Statutory Authority: RCW 88.16.035.
296-116-100	Details and requirements of new applications (Puget Sound and adjacent inland waters). [Order 76-12, § 296-116-100, filed 4/22/76; Order 74-33, § 296-116-100, filed 7/10/74; Order 69-4, § 296-116-100, filed 7/18/69; Order 2-68, § 296-116-100, filed 11/1/68; § 10, subsection 2, filed 7/18/61, 10/23/61, remainder of § 10, effective 11/25/58.] Repealed by 80-03-081 (Order 79-6, Resolution No. 79-6), filed 3/4/80. Statutory Authority: RCW 88.16.035.
296-116-105	Details and requirements of new applications (Grays Harbor or Willapa Bay). [Order 76-12, § 296-116-105, filed 4/22/76; Order 73-6, § 296-116-105, filed 5/11/73; Order 2-68, § 296-116-105, filed 11/1/68.] Repealed by 80-03-081 (Order 79-6, Resolution No. 79-6), filed 3/4/80. Statutory Authority: RCW 88.16.035.
296-116-160	Mileage on Puget Sound and adjacent inland waters. [Order 73-6, § 296-116-160, filed 5/11/73; Order 2-68, § 296-116-160, filed 11/1/68; § 16, effective 11/25/58.] Repealed by 80-03-081 (Order 79-6, Resolution No. 79-6), filed 3/4/80. Statutory Authority: RCW 88.16.035.
296-116-180	Tariffs, Puget Sound and adjacent inland waters. [Order 2-68, § 296-116-180, filed 11/1/68; § 18, effective 11/25/58.] Repealed by 80-03-081 (Order 79-6, Resolution No. 79-6), filed 3/4/80. Statutory Authority: RCW 88.16.035.
296-116-190	Hearings. [Order 2-68, § 296-116-190, filed 11/1/68.] Repealed by 80-03-081 (Order 79-6, Resolution No. 79-6), filed 3/4/80. Statutory Authority: RCW 88.16.035.
296-116-210	Annual report. [Order 2-68, § 296-116-210, filed 11/1/68; § 21, effective 11/25/58.] Repealed by 80-03-081 (Order 79-6, Resolution No. 79-6), filed 3/4/80. Statutory Authority: RCW 88.16.035.
296-116-220	Effective date and validity. [Order 2-68, § 296-116-220, filed 11/1/68; § 22, effective 11/25/58.] Repealed by 80-03-081 (Order 79-6, Resolution No. 79-6), filed 3/4/80. Statutory Authority: RCW 88.16.035.
296-116-310	Puget Sound pilots transportation schedule. [Order 77-18, § 296-116-310, filed 9/20/77, effective 11/1/77; Order 76-24, § 296-116-310, filed 7/22/76; Order 73-8, § 296-116-310, filed 6/20/73 and Emergency Order 73-10, filed 7/19/73, effective 8/14/73; Order 70-7, § 296-116-310, filed 7/16/70; 7/25/67; 2/18/64.] Repealed by 80-03-081 (Order 79-6, Resolution No. 79-6), filed 3/4/80. Statutory Authority: RCW 88.16.035.

- 296-116-320 Retirement fund contribution. [Statutory Authority: RCW 88.16.035, 83-05-049 (Order 83-2, Resolution No. 83-2), § 296-116-320, filed 2/16/83; 82-13-087 (Order 82-10-049, Resolution No. 82-10-049), § 296-116-320, filed 6/23/82; 80-03-081 (Order 79-6, Resolution No. 79-6), § 296-116-320, filed 3/4/80. Statutory Authority: Chapter 88.16 RCW and 1977 ex. sess. c 337, §§ 1 and 4. 78-02-008 (Order 78-1), § 296-116-320, filed 1/6/78, effective 2/10/78; Order 77-18, § 296-116-320, filed 9/20/77, effective 11/1/77; Order 76-24, § 296-116-320, filed 7/22/76; Order 76-12, § 296-116-320, filed 4/22/76; Order 73-8, § 296-116-320, filed 6/20/73 and Emergency Order 73-10, filed 7/19/73, effective 8/14/73; Order 70-7, § 296-116-320, filed 7/16/70; 7/25/67.] Repealed by 88-10-039 (Order 88-11, Resolution No. 88-11), filed 5/3/88. Statutory Authority: RCW 88.16.035.
- 296-116-330 Marine pilot—Trip insurance. [Statutory Authority: RCW 88.16.117, 83-03-037 (Order 83-1, Resolution No. 83-1), § 296-116-330, filed 1/17/83.] Repealed by 84-11-041 (Order 84-3, Resolution No. 84-3), filed 5/16/84. Statutory Authority: RCW 88.16.035(1).
- 296-116-350 Tariff, Grays Harbor and Willapa Bay pilots. [Order 71-4, § 296-116-350, filed 5/11/71, effective 6/15/71; Order 2-67 (part), filed 8/3/67, effective 9/5/67; Emergency Rule 1-67, filed 6/8/67.] Repealed by Order 75-1, filed 1/14/75.
- 296-116-351 Pilotage rates for Grays Harbor and Willapa Bay pilotage district. [Statutory Authority: RCW 88.16.035, 79-05-023 (Order 79-2, Resolution No. 79-2), § 296-116-351, filed 4/17/79; Statutory Authority: RCW 88.16.005 and 88.16.035, 79-02-030 (Order 79-1, Resolution No. 79-1), § 296-116-351, filed 1/19/79; 78-02-008 (Order 78-1), § 296-116-351, filed 1/6/78, effective 2/10/78; Order 75-1, § 296-116-351, filed 1/14/75.] Repealed by 80-03-081 (Order 79-6, Resolution No. 79-6), filed 3/4/80. Statutory Authority: RCW 88.16.035.

**WAC 296-116-010 Time and place of meeting.** The regular monthly meeting of the board of pilotage commissioners shall be on the second Thursday of each month at 9:00 a.m. at Pier 52, Seattle, Washington in the offices of the Washington state ferries unless another time and place has been designated by the chairperson at the last previous meeting. If the aforementioned day falls on a holiday, the meeting shall take place on the following Thursday at the same hour.

[Statutory Authority: RCW 88.16.035 and 88.16.155, 78-09-057 (Order 78-2, Resolution No. 78-2), § 296-116-010, filed 8/23/78; Order 2-68, § 296-116-010, filed 11/1/68; § 1, effective 11/25/58.]

**WAC 296-116-020 Special meeting.** A special meeting of the board of pilotage commissioners may be called by the presiding officer, or by a majority of the members of the board, by delivering personally or by mail written notice to all other members of the board at least twenty-four hours before the time of such meeting as specified in the notice. The notice calling a special meeting shall state the purpose for which the meeting is called and the date, hour, and place of such meeting and all provisions of chapter 42.30 RCW shall apply.

[Statutory Authority: RCW 88.16.035, 88-09-025 (Order 88-3, Resolution No. 88-3), § 296-116-020, filed 4/14/88. Statutory Authority: RCW 88.16.035 and 88.16.155, 78-09-057 (Order 78-2, Resolution No. 78-2), § 296-116-020, filed 8/23/78; Order 2-68, § 296-116-020, filed 11/1/68; § 2, effective 11/25/58.]

**WAC 296-116-030 Emergency meeting.** If, by reason of an emergency, there is a need for expedited action by the board to meet the emergency, the presiding officer may provide for a meeting site, and the notice requirements of chapter 42.30 RCW shall be suspended during such emergency. To the extent possible, notice of such emergency meeting will be delivered personally, by telephone, telegram, or mail to the members of the board and interested persons, and shall specify the time and place of the emergency meeting and the business to be transacted. Any action taken by the board at such emergency meeting may be reconsidered by the board at its next regular monthly meeting.

[Statutory Authority: RCW 88.16.035, 88-09-026 (Order 88-4, Resolution No. 88-4), § 296-116-030, filed 4/14/88. Statutory Authority: RCW 88.16.035 and 88.16.155, 78-09-057 (Order 78-2, Resolution No. 78-2), § 296-116-030, filed 8/23/78; Order 2-68, § 296-116-030, filed 11/1/68; § 3, effective 11/25/58.]

**WAC 296-116-050 Records.** The board of pilotage commissioners shall keep accurate records of the minutes of the meetings, records of pilots' earnings, mileage piloted, accident reports, licenses, applications for licenses, examinations for licenses, and any and all other records deemed necessary by the board.

[Order 2-68, § 296-116-050, filed 11/1/68; § 5, effective 11/25/58.]

**WAC 296-116-060 Personnel.** The board shall employ the necessary personnel for the conduct of its business following the personnel practices and salary schedules of the Washington state ferries.

[Statutory Authority: RCW 88.16.035 and 88.16.155, 78-09-057 (Order 78-2, Resolution No. 78-2), § 296-116-060, filed 8/23/78; Order 2-68, § 296-116-060, filed 11/1/68; § 6, effective 11/25/58.]

**WAC 296-116-070 Collection of fees.** All pilots shall pay an annual license fee of one thousand five hundred dollars for every year in which they perform any pilotage services. If a licensed pilot does not perform pilotage services during a license year, his fee for that year shall be reduced to five hundred dollars upon application to the board. The board of pilotage commissioners shall receive all fees for licenses or for other purposes and make proper accounting of same and transmit all such funds to the pilotage account.

[Statutory Authority: RCW 88.16.035, 88-14-063 (Order 88-13, Resolution No. 88-13), § 296-116-070, filed 7/1/88. Statutory Authority: RCW 88.16.090, 85-15-032 (Order 85-1, Resolution No. 85-1), § 296-116-070, filed 7/12/85; 84-11-056 (Order 84-4, Resolution No. 84-4), § 296-116-070, filed 5/18/84. Statutory Authority: RCW 88.16.035, 82-24-010 (Order 82-8, Resolution No. 82-8), § 296-116-070, filed 11/18/82; 79-11-063 (Order 79-5, Resolution No. 79-5), § 296-116-070, filed 10/18/79. Statutory Authority: RCW 88.16.035 and 88.16.155, 78-09-057 (Order 78-2, Resolution No. 78-2), § 296-116-070, filed 8/23/78; Order 2-68, § 296-116-070, filed 11/1/68; § 7, effective 11/25/58.]

**WAC 296-116-075 Qualifications for pilot applicants.** Under the authority of RCW 88.16.090 pilot applicants must meet one of the following additional qualifications before taking the Washington state pilotage examination for either the Grays Harbor or Puget Sound pilotage districts:



(1) One year of service as master of ocean or coastwise vessels while holding a license as master ocean steam or motor vessels any gross tons; or

(2) One year of service as master of coastwise steam or motor vessels while holding a license as a master of coastwise steam or motor vessels any gross tons; or

(3) Two years of service as master of freight or towing vessel, while holding a license as a master of freight and towing vessels not more than 1000 gross tons; or

(4) Two years of service as master on lakes, bays, and sounds while holding a license as master on lakes, bays, and sounds any gross tons; or

(5) Three years of experience as a member of an organized professional pilots association, during which period the candidate was actively engaged in piloting while holding a minimum license as a master freight or towing vessel not more than 1000 gross tons; or

(6) Two years service as a chief officer on ocean or coastwise vessels of not less than 1000 gross tons while holding a license as master ocean steam or motor vessel any gross tons; or

(7) Two years service as commanding officer of U.S. government vessels of not less than 1000 gross tons, and holding a license as master ocean steam or motor vessel any gross tons.

Note: (All licenses referred to in sections (1)-(7) shall be licenses for inspected vessels).

[Statutory Authority: RCW 88.16.090, 82-15-026 (Order 82-6, Resolution No. 82-6), § 296-116-075, filed 7/14/82.]

**WAC 296-116-080 Licensing of pilots.** (1) No person shall be licensed by the board unless he has applied for a pilotage license and successfully completed: (a) The pilotage examination; (b) familiarization trips required by the board; and (c) the pilotage training program, if applicable.

The majority of the entire board shall pass on the licensing of a pilot and licenses shall be signed by the chairperson. All applicants shall have and display a United States Government Masters License and a first class United States endorsement without restrictions on that license to pilot in whichever pilotage district the applicant desires a license. In addition all applicants shall have and display an endorsement to their masters license issued by the United States Coast Guard certifying competence as a radar observer.

(2) Prior to commencing familiarization trips, and the pilot training program, if applicable, an applicant must pass a written and oral examination given and graded by the board. The board will conduct such examinations for both pilotage districts during the month of April in each odd-numbered year. Notice of the examination shall be published four months in advance by one paid advertisement in a major newspaper and written notice to one radio station, one television station, United Press International, and the Associated Press, as well as all pilots licensed by the board and all operators registered with the board. Applications will be accepted by the board immediately following the publication of the notice of the examination. The board may, in an emergency, call

for an immediate examination on less than four months notice.

(a) The examination may be taken by all qualified applicants who:

(i) Have had a license application on file with the board for at least one month prior to the examination. (This requirement may be waived upon the showing of good cause;)

(ii) Have tendered a nonrefundable examination fee of three hundred dollars. The board may, at its discretion, refund the examination fee for an applicant who is unable to sit for the examination.

(iii) Have had a physical examination by a physician designated by the board not more than thirty days prior to the examination to determine his physical fitness to be a pilot.

(b) The examination shall be in compliance with RCW 88.16.090 and shall consist of questions covering, but not limited to, the following subjects as they pertain to the pilotage district for which the examination is being given:

(i) Rules of the road as set forth in United States government publications;

(ii) Aids to navigation;

(iii) Courses, distances, and distance past abeam at change-of-course points, course points within channels, waterways, and navigable tributaries within the pilotage district for which the examination is being given;

(iv) Cable crossing areas;

(v) Channel and passage widths, depths and shoal areas;

(vi) Bridge signals - width, regulations, and closed periods;

(vii) Ship handling, docking and undocking problems, use of towboats and anchors, and seamanship;

(viii) Vessel traffic system regulations where applicable;

(ix) Ranges for determining compass error and measured miles;

(x) Channel ranges;

(xi) Engine and rudder order commands for United States and foreign merchant vessels and United States naval vessels;

(xii) Operation and use of marine radar, including rapid plotting techniques;

(xiii) Knowledge of tidal currents and ability to calculate currents and tides;

(xiv) Pier, wharf, or terminal locations and berth numbers; dock or pier headings, lengths, and minimum depths of water alongside;

(xv) Prohibited areas, restricted areas, and explosive anchorages;

(xvi) Use of navigational and bridge instruments;

(xvii) Anchorage locations;

(xviii) Duties of pilot;

(xix) Relationship between pilot and master;

(xx) Location and meaning of storm warning signals;

(xxi) Meaning of one and two flag signals;

(xxii) United States government public health quarantine regulations;

(xxiii) Harbor regulations;



(xxiv) Washington State Pilotage Act and rules of the board of pilotage commissioners;

(xxv) Chart knowledge, including chart symbols and abbreviations as set forth in the latest department of commerce NOS (National Ocean Survey) Chart No. 1.

(3) After passing the examination, applicants for the Puget Sound pilotage district must enter and successfully complete a training program. In this program applicants shall be required to pilot vessels under the supervision of Puget Sound pilots with more than five years experience. Upon written request by an applicant to the board, the five years' experience requirement for the supervisory pilot may be waived in certain instances. After every such assignment the supervisory pilots shall fill out, on a form provided by the board, an evaluation of the applicant's performance. After completion of the training period, the board shall evaluate the applicant's performance in shiphandling skills on the basis of these forms and other relevant information and decide whether the applicant should be licensed. Dependent on the applicant's experience level and grade of license, applicants in this training program shall pilot under such supervision for a minimum period of four months and seventy-five assignments and a maximum period of six months and one hundred assignments.

(4) After passing the examination, applicants for the Grays Harbor pilotage district must enter and successfully complete a training program. In this program applicants shall be required to pilot vessels under the supervision of Grays Harbor pilots with more than five years' experience. Upon written request by an applicant, to the board, the five years' experience requirement for the supervisory pilot may be waived in certain instances. After every such assignment the supervisory pilots shall fill out, on a form provided by the board, an evaluation of the applicant's performance. After completion of the training period, the board shall evaluate the applicant's performance in shiphandling skills on the basis of these forms and other relevant information and decide whether the applicant should be licensed. Dependent on the applicant's experience level and grade of license, applicants in this training program shall pilot under such supervision for a minimum period of four months and twenty-five assignments and a maximum period of six months and fifty assignments.

[Statutory Authority: RCW 88.16.090. 89-18-045 (Order 89-7, Resolution No. 89-7), § 296-116-080, filed 8/31/89, effective 10/1/89; 88-10-037 (Order 88-9, Resolution No. 88-9), § 296-116-080, filed 5/3/88. Statutory Authority: RCW 88.16.035. 86-07-010 (Order 86-2, Resolution No. 86-2), § 296-116-080, filed 3/10/86. Statutory Authority: RCW 88.16.090. 82-15-028 (Order 82-7, Resolution No. 82-7), § 296-116-080, filed 7/14/82; 81-21-019 (Order 81-4, Resolution No. 81-4), § 296-116-080, filed 10/13/81. Statutory Authority: RCW 88.16.035. 80-03-081 (Order 79-6, Resolution No. 79-6), § 296-116-080, filed 3/4/80; 79-11-063 (Order 79-5, Resolution No. 79-5), § 296-116-080, filed 10/18/79; 79-05-023 (Order 79-2, Resolution No. 79-2), § 296-116-080, filed 4/17/79; Order 75-8, § 296-116-080, filed 3/10/75; Order 73-6, § 296-116-080, filed 5/11/73; Order 2-68, § 296-116-080, filed 11/1/68; § 8, effective 11/25/58.]

**WAC 296-116-081 Rest period.** (1) Pilots shall observe rest period requirements as set out in RCW 88.16-.103 as now or hereafter amended. For purposes of

applying this rule an assignment shall begin at the pilot's dispatched departure time if the pilot is on board, regardless of when the ship actually sails. The assignment ends when the pilot leaves the vessel. Travel time shall not be included in an assignment.

[Statutory Authority: RCW 88.16.035. 79-05-023 (Order 79-2, Resolution No. 79-2), § 296-116-081, filed 4/17/79; Order 73-6, § 296-116-081, filed 5/11/73.]

**WAC 296-116-082 Limitations on new pilots.** The initial license issued by the board to a new pilot shall not authorize such pilot to perform pilotage services on any vessel of a size of 25,000 gross tons (International) or more, or of over 660 feet in length for the first year that such licensee becomes an active pilot. During this first year the licensee will not be authorized to pilot loaded petroleum tankers. During the second year of piloting under an initial license the pilot may perform pilotage on vessels in excess of 25,000 gross tons (International) and up to 35,000 gross tons (International) if such pilotage does not include the docking or undocking of the vessel. During the third year of piloting under an initial license the pilot may perform pilotage on vessels not over 35,000 gross tons (International), however, the pilot may perform pilotage on vessels in excess of 35,000 gross tons (International) if such pilotage does not include the docking or undocking of the vessel. The initial license shall contain the above limitations and the date of the commencement and expiration of such periods of limitation. The board shall also prescribe required familiarization trips before a newly licensed pilot may pilot a larger or different type of vessel. Prior to the pilot's third anniversary, the licensee shall provide the board with a certificate or other written proof that the pilot has completed a course of continuing education at an accepted simulator school or other recognized ship handling institution. This shall be done before all restrictions are lifted from the pilot's license.

[Statutory Authority: RCW 88.16.105. 89-18-063 (Order 89-6, Resolution No. 89-6), § 296-116-082, filed 9/1/89, effective 10/2/89; 89-11-060 (Order 89-5, Resolution No. 89-5), § 296-116-082, filed 5/18/89. Statutory Authority: RCW 88.16.035. 80-03-081 (Order 79-6, Resolution No. 79-6), § 296-116-082, filed 3/4/80.]

**WAC 296-116-083 Examination review and appeal procedures.** (1) Any candidate who takes the state examination for licensure may request a review by the board of his or her examination results. This request must be in writing and must be received by the board within fifteen days of receipt of notification of the examination results. The board will not set aside its prior determination unless the candidate proves the challenged score was the result of fraud, coercion, arbitrariness or manifest unfairness by the board. The board will not consider any challenges to examination scores unless the total revised score could result in a higher ranking to enter the training program or a passing grade on the pilotage examination.

(2) The procedure for filing a review is as follows:

(a) Contact the board office for an appointment to appear personally to review incorrect answers on the examination.

(b) The candidate will be provided a form to complete in the board office in defense of the examinee's examination answers.

(c) The candidate must state the specific reason or reasons why the candidate feels the results of the examination should be changed.

(d) The candidate will be identified only by candidate number for the purpose of this review. Letters of reference or requests for special consideration will not be read or considered by the board.

(e) Candidates may not bring in notes or texts for use while completing the informal review form.

(f) Candidates will not be allowed to take any notes or materials from the office upon leaving.

(g) The board will schedule a closed session meeting to review the examinations and forms completed by the candidate for the purpose of informal review.

(h) The candidates will be notified in writing of the results.

(3) Any candidate who is not satisfied with the result of the examination review may request a formal hearing pursuant to RCW 88.16.100. Such hearing must be requested within thirty days of receipt of the result of the board's review of the examination results.

[Statutory Authority: RCW 88.16.035, 88-10-038 (Order 88-10, Resolution No. 88-10), § 296-116-083, filed 5/3/88.]

**WAC 296-116-085 Association bylaws.** The association of pilots for the Puget Sound pilotage district, together with the association of pilots for the Grays Harbor pilotage district, shall maintain on file with the commission a current copy of their respective association bylaws and amendments. Hereafter they shall file with the commission each new amendment adopted by their respective groups in order that the board may be kept informed of association acts and activities.

[Statutory Authority: RCW 88.16.035, 82-13-087 (Order 82-10-049, Resolution No. 82-10-049), § 296-116-085, filed 6/23/82; Order 76-12, § 296-116-085, filed 4/22/76.]

**WAC 296-116-110 Details and requirements of renewal application.** All applications for renewal of licenses shall be submitted in writing to the board at least thirty days prior to the expiration date of the license, and be accompanied by a certified check payable to the state treasurer in the amount of the annual license fee. All applicants for renewal of licenses shall be required to display their currently applicable United States government license with radar endorsement issued by the United States Coast Guard.

[Statutory Authority: RCW 88.16.035, 80-03-081 (Order 79-6, Resolution No. 79-6), § 296-116-110, filed 3/4/80; Order 2-68, § 296-116-110, filed 11/1/68; § 11, effective 11/25/58.]

**WAC 296-116-120 Physical requirements.** (1) In order to determine the physical fitness of persons to serve as licensed pilots under the provisions of the pilotage act, all licensed pilots and applicants shall be required to pass a general physical examination annually within forty-five days prior to the date their annual state pilot license fee is due. As part of this examination

pilots and applicants shall have completed on a form provided by the board a detailed report of physical examination. This form shall be prepared by the examining physician and shall be submitted to the board along with a letter stating whether and under what conditions the pilot or applicant is capable of providing pilotage services. The completion of the form and the letter to the board satisfies the minimum health standards of RCW 88.16.090(6). The detailed report of physical examination is a confidential record and will not be available for public inspection. Such examination shall be obtained at the expense of the licensed pilots or applicants from a physician or physicians designated in advance by the board. The secretary of the board shall give each pilot or applicant reasonable written notice of the date when any such physical examination becomes due and shall specify the name of the physicians then approved by the board to conduct such physical examination.

(2) The physical examination required of all pilots and applicants shall demonstrate that he is in all respects physically fit to perform his duties as a pilot. The examination shall assure that one's abilities as a pilot will not be impaired by eyesight, hearing or other bodily function and shall include examination of the pilot's or applicant's eyes (including tests for color blindness, depth perception, night vision, disease, field of vision and reflexes); ears; heart; blood pressure; blood components; pulse; speech capabilities; history of diseases (including diabetes, cancer, arthritis, arrhythmia, asthma, bronchitis, emphysema, ulcers, alcoholism and other illnesses) and any other type of information which the physician feels is relevant.

(3) In the case of renewal of license as pilot, should the pilot be temporarily physically incapacitated at the time his license is due to be renewed, the commission shall not revoke such license until a further physical examination to be given at the expiration of three months. This procedure shall be carried on until it is evident that the pilot is permanently incapacitated; provided further, that no pilot shall be carried on the inactive list for longer than one year if disabled. Any pilot who is physically incapacitated shall not serve as a pilot during such period of incapacitation.

[Statutory Authority: RCW 88.16.090, 88-09-027 (Order 88-5, Resolution No. 88-5), § 296-116-120, filed 4/14/88; 85-15-033 (Order 85-2, Resolution No. 85-2), § 296-116-120, filed 7/12/85. Statutory Authority: RCW 88.16.035 and 88.16.090(6), 80-16-005 (Resolution No. 79-5), § 296-116-120, filed 10/23/80. Statutory Authority: RCW 88.16.035, 79-11-063 (Order 79-5, Resolution No. 79-5), § 296-116-120, filed 10/18/79; Order 73-6, § 296-116-120, filed 5/11/73; Order 2-68, § 296-116-120, filed 11/1/68; § 12, effective 11/25/58.]

**WAC 296-116-130 Period of incapacitation.** (1) Any pilot who is physically incapacitated as a pilot for a period of ninety days or more shall not return to service as an active pilot until he has passed a physical examination by a physician designated by the board.

(2) In the event a pilot fails to pass such physical examination, he shall have the right to a further examination by a medical commission composed of the board's

physician, a physician selected by the pilot, and a third physician to be selected by these two physicians.

[Statutory Authority: RCW 88.16.035. 80-03-081 (Order 79-6, Resolution No. 79-6), § 296-116-130, filed 3/4/80; Order 2-68, § 296-116-130, filed 11/1/68; § 13, effective 11/25/58.]

**WAC 296-116-140 Limitations.**

[Order 2-68, § 296-116-140, filed 11/1/68.]

**WAC 296-116-150 Registration of operators.** All ship owners, operators and agents of owners and operators whose vessels are subject to the pilotage act must register with the board and keep the board advised of any change of name or address.

[Order 2-68, § 296-116-150, filed 11/1/68; § 15, effective 11/25/58.]

**WAC 296-116-170 Pilotage station.** Port Angeles is hereby declared the location of the pilotage station for Puget Sound and adjacent inland waters and tariffs shall be assessed accordingly. Boundary pilotage shall apply on ships going to and coming from all British Columbia ports.

[Order 2-68, § 296-116-170, filed 11/1/68; § 17, effective 11/25/58.]

**WAC 296-116-175 Tariff proposals.** The board of pilotage commissioners has been charged with certain statutory duties by RCW 88.16.035. To assist the board in its responsibilities to provide for the maintenance of efficient and competent pilotage services and to annually fix the pilotage tariffs for pilotage services to be performed on the waters covered by chapter 88.16 RCW, it shall be the policy that licensed pilots, ship operators, and interested members of the public may jointly or separately present tariff proposals to the board for its consideration. To that end, individual Washington state licensed pilots, independent ship owners or operators, members of the public and/or agents, committees or organizations representing said persons or corporations are authorized to meet, discuss, and prepare joint or separate tariff proposals for board consideration. They may appear before the board to support or oppose any such proposal, or part thereof, but the final determination, adoption and active supervision of the rates, charges, expense items, and classifications to be contained in said pilotage tariffs and the rules, regulations, or procedures to implement said annual tariffs shall be made by the board.

[Statutory Authority: RCW 88.16.035. 87-19-100 (Order 87-1, Resolution No. 87-1), § 296-116-175, filed 9/17/87.]

**WAC 296-116-185 Tariffs, and pilotage rates for the Grays Harbor pilotage district.** The following rates shall become effective on May 1, 1989.

**CLASSIFICATION OF PILOTAGE SERVICE RATE**

**Piloting of vessels in the inland waters and tributaries of Grays Harbor:**

Each vessel shall be charged according to its draft and tonnage. The draft charges shall be \$35.13 per meter (or \$10.70 per foot) and the tonnage charge shall be \$0.1121 per net registered ton. The minimum net registered tonnage charge is \$392.00. The charge for an extra vessel (in case of tow) is \$224.00.

**Boarding fee:**

Per each boarding/deboarding from a boat . . . . . \$169.00

**Harbor shifts:**

For each shift from dock to dock, dock to anchorage, anchorage to dock, or anchorage to anchorage . . . . . \$281.00  
Delays per hour . . . . . \$ 67.00  
Cancellation charge (pilot only) . . . . . \$112.00  
Cancellation charge (pilot boat only) . . . . \$336.00

**Travel allowance:**

Boarding or deboarding a vessel off Grays Harbor entrance . . . . . \$ 52.00  
Pilot when traveling to an outlying port to join a vessel or returning through an outlying port from a vessel which has been piloted to sea shall be paid \$430.00 for each day or fraction thereof, and the travel expense incurred . . . . . \$392.00

**Bridge transit:**

Charge for each bridge transited . . . . . \$123.00

**Miscellaneous:**

The balance of amounts due for pilotage rates not paid within 45 days of invoice will be assessed at 1 1/2% per month late charge.

[Statutory Authority: RCW 88.16.035. 89-08-042 (Order 89-3, Resolution No. 89-3), § 296-116-185, filed 3/31/89; 88-05-043 (Order 88-2, Resolution No. 88-2), § 296-116-185, filed 2/17/88, effective 3/21/88. Statutory Authority: RCW 88.16.035(4). 87-01-081 (Orders 86-9 and 86-10, Resolution Nos. 86-9 and 86-10), § 296-116-185, filed 12/19/86; 85-02-048 (Order 84-5, Resolution No. 84-5), § 296-116-185, filed 12/31/84; 83-15-012 (Order 83-3, Resolution No. 83-3), § 296-116-185, filed 7/12/83; 82-08-016 (Order 82-1, Resolution No. 82-1), § 296-116-185, filed 3/29/82; 81-07-009 (Order 81-1, Resolution No. 81-1), § 296-116-185, filed 3/6/81; 80-03-081 (Order 79-6, Resolution No. 79-6), § 296-116-185, filed 3/4/80; Order 2-68, § 296-116-185, filed 11/1/68.]

**WAC 296-116-200 Duties of pilots.** (1) In any case where a vessel in charge of a state licensed pilot shall go aground, collide with another vessel, or dock, or shall meet with any casualty, or be injured or damaged in any way, the said pilot shall, within ten days thereafter,

make written report thereof to said board, and the board of pilotage commissioners may thereupon, either with or without complaint being made against the said pilot, investigate the matter reported upon. In any case of apparent damage being sustained or caused by a vessel under his charge, the pilot shall file his written report as soon as possible after returning to shore. It is important that the board be promptly advised of the facts in all cases of accident, without delay.

(2) Pilots will report to the pilot office and to the aids to navigation officer of the U.S. Coast Guard, all changes in lights, range lights, buoys, and any dangers to navigation that may come to their knowledge.

(3) Any pilot who shall fail, neglect or refuse to make a report to the board of pilotage commissioners as required by the pilotage laws of the state, or by these rules and regulations, for a period of ten days after the date when the said report is required to be made, shall be subject to having his license suspended at the discretion of the board, and if he fails to report for a period of thirty days the board may, at its discretion, revoke his license.

(4) Pilots when so notified in writing shall report in person to the board, at any meeting specified in such notice.

(5) Any pilot summoned to testify before the pilotage board shall appear in accordance with such summons and shall make answer, under oath, to any question put to him which deals with any matter connected with the pilot service, or of the pilotage waters over which he is licensed to act. He shall be entitled to have his attorney or advisor present during any such appearance and testimony.

(6) Any pilot who shall absent himself from his pilotage duties or district for a period of sixty days without permission of the board of pilotage commissioners shall be liable to suspension or to the forfeiture of his license.

(7) A pilot on boarding a ship, if required by the master thereof, shall exhibit his license, or photostatic copy thereof.

(8) When a pilot licensed under this act is employed on an enrolled ship, the same rules and regulations shall apply as pertain to registered ships.

(9) Any state licensed pilot assigned to pilot a vessel entering, leaving, or shifting berths under its own power in any of the waters subject to the provisions of chapter 88.16 RCW shall before assuming pilotage obligations for such vessel obtain assurance from the master that the vessel meets all requirements for safe navigation and maneuvering. In addition, the pilot shall obtain assurance that the ship's officers will maintain navigation procedures by all navigational aids available to insure that the vessel's position is known at all times. If the pilot in his professional judgment considers the vessel to be incapable of safe navigation and maneuvering due to performance limitations, he shall refuse to assume the obligations of pilotage for such vessel until such limitations have been corrected and shall promptly notify the pilot's control station and the chairman of the board of pilotage commissioners of such action.

[Order 73-6, § 296-116-200, filed 5/11/73; Order 2-68, § 296-116-200, filed 11/1/68; § 20, effective 11/25/58.]

**WAC 296-116-205 Vessel certification.** (1) Upon boarding a vessel in the Puget Sound pilotage district or Grays Harbor pilotage district, a pilot shall request on the form provided in WAC 296-116-2051 that the master of the vessel certify that: (a) The engine room is properly staffed, able to maneuver, and all related equipment is in good order; (b) there are no defects listed against the ship by the United States Coast Guard which would prevent it from sailing; (c) the vessel is not leaking oil; (d) the vessel is experiencing no propulsion or maneuvering difficulties.

If the master is unable to certify that all of the above conditions are met, he shall be asked to certify that the United States Coast Guard captain of the port has been notified of said deficiencies and has authorized the vessel to proceed.

If the master is unable or unwilling to certify that either of the above are the case, the pilot shall not offer pilotage services to said vessel. Instead, the pilot shall disembark from the vessel as soon as practicable, immediately inform the captain of the port of the conditions and circumstances by the best possible means and forward a written report to the board of pilotage commissioners no later than 24 hours after disembarking from the vessel. Any Washington licensed pilot who offers pilotage services to a vessel on which the master has failed to make a certification required by this section shall be subject to the penalties provided in RCW 88.16.100 and 88.16.150.

(2) Upon boarding vessels in either the Puget Sound pilotage district or the Grays Harbor pilotage district, the pilot shall also request to see the vessel's SOLAS certificate, and the Federal Maritime Commission certificate of financial responsibility.

The pilot shall also inspect the following of the ship's equipment and conditions and indicate their suitability:

VHF radio, channels 13, 14; radar; gyrocompass; rudder angle indicator; whistle; wheelhouse staffed by an officer and helmsman, one of whom speaks English; local, up-to-date charts; and wheelhouse to engine room communications.

(3) The form appearing in WAC 296-116-2051 shall be used by pilots and masters in complying with the above requirements.

(4) Forms completed by masters and pilots which indicate that the vessel is in compliance and nondeficient shall be forwarded to the offices of the board of pilotage commissioners where they will be retained for a period of at least six months. Forms indicating a vessel not in compliance or deficient and forms upon which either the master or the pilot have failed to make the required certification shall be forwarded to the board of pilotage commissioners and retained for a period of at least twelve months.

[Statutory Authority: RCW 88.16.035, 82-13-087 (Order 82-10-049, Resolution No. 82-10-049), § 296-116-205, filed 6/23/82; 79-11-063 (Order 79-5, Resolution No. 79-5), § 296-116-205, filed 10/18/79. Statutory Authority: RCW 88.16.035 and 88.16.155. 78-

09-057 (Order 78-2, Resolution No. 78-2), § 296-116-205, filed 8/23/78.]

**WAC 296-116-2051 Vessel certification form.**

Washington State Board of Pilotage Commissioners

Date:

Vessel Name:

Flag:

**MASTER'S CERTIFICATION**

I, \_\_\_\_\_, Master of this vessel, certify the following information:

	Yes	No
Is the engine room properly staffed, the engine able to maneuver, and all related equipment in good order?	<input type="checkbox"/>	<input type="checkbox"/>
Does this ship meet United States Coast Guard regulations governing safety and navigation?	<input type="checkbox"/>	<input type="checkbox"/>
Does this vessel comply with current international agreements governing safety and radio equipment?	<input type="checkbox"/>	<input type="checkbox"/>
Is this vessel leaking oil?	<input type="checkbox"/>	<input type="checkbox"/>
Is this vessel experiencing propulsion or maneuvering difficulties?	<input type="checkbox"/>	<input type="checkbox"/>

I have notified the United States Coast Guard Captain of the Port of any deficiencies noted above and he has authorized the vessel to proceed. Any such deficiencies will be corrected before the time the vessel is scheduled to leave the waters of Washington state.

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Master's Signature

**PILOT'S REPORT**

I, \_\_\_\_\_, a pilot licensed by the state of Washington, certify that upon boarding the above-named vessel on this date I requested to see the following certificates:

CERTIFICATE	NOT READILY		
	ACCEPTABLE	AVAILABLE	UNACCEPTABLE
SOLAS Certificate	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
FMC Certificate of Financial Responsibility	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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Pilot's Signature

[Statutory Authority: RCW 88.16.035 and 88.16.155. 83-16-032 (Order 83-4, Resolution No. 83-4), § 296-116-2051, filed 7/28/83.

(1989 Ed.)

Statutory Authority: RCW 88.16.155. 79-11-097 (Order 79-6, Resolution No. 79-6), § 296-116-2051, filed 10/29/79. Statutory Authority: RCW 88.16.035 and 88.16.155. 78-09-057 (Order 78-2, Resolution No. 78-2), § 296-116-2051, filed 8/23/78.]

**WAC 296-116-300 Pilotage rates for the Puget Sound pilotage district.** These rates shall become effective on May 1, 1989.

CLASSIFICATION	RATE
Ship length overall (LOA) Charges:	per LOA rate schedule in this section
Boarding fee: Per each boarding/deboarding at the Port Angeles pilot station.	\$ 25.00
Harbor shift - Live ship (Seattle Port)	LOA Zone I
Harbor shift - Live ship (other than Seattle Port)	LOA Zone I
Harbor shift - Dead ship	Double LOA Zone I
Dead ship towing charge: LOA of tug + LOA of tow + beam of tow Any tow exceeding seven hours, two pilots are mandatory. Harbor shifts shall constitute and be limited to those services in moving vessels from dock to dock, from anchorage to dock, from dock to anchorage, or from anchorage to anchorage in the same port after all other applicable tariff charges for pilotage services have been recognized as payable.	Double LOA Zone
Waterway and bridge charges: Ships up to 90' beam: A charge of \$134.00 shall be in addition to bridge fees for any vessel movements both inbound and outbound required to transit south of Spokane Street Bridge in Seattle, south of Eleventh Street Bridge in any of the Tacoma waterways, in Port Gamble, or in the Snohomish River. Any vessel movements required to transit through bridges shall have an additional charge of \$64.00 per bridge.	
Ships 90' beam and/or over: A charge of \$181.00 shall be in addition to bridge fees for any vessel movements both inbound and outbound required to transit south of Spokane Street Bridge in Seattle and south of Eleventh Street Bridge in any of the Tacoma waterways. Any vessel movements required to transit through bridges shall have an additional charge of \$127.00 per bridge. (The above charges shall not apply to transit of vessels from Shilshole Bay to the limits of Lake Washington.)	
Two pilots required: In a case where two pilots are employed for a single vessel waterway or bridge transit, a second pilot charge shall include the bridge and waterway charge in addition to the harbor shift rate.	
Compass adjustment	\$180.00
Radio direction finder calibration	\$180.00
Launching vessels	\$271.00
Trial trips, 6 hours or less (Minimum \$511.00)	\$ 85.00 per hr.
Trial trips, over 6 hours (two pilots)	\$170.00 per hr.
Shilshole Bay - Salmon Bay	\$106.00
Salmon Bay - Lake Union	\$ 83.00
Lake Union - Lake Washington (plus LOA zone from Webster Point)	\$106.00
Cancellation charge	LOA Zone I

[Title 296 WAC—p 1801]

CLASSIFICATION	RATE	CLASSIFICATION	RATE
Cancellation charge — Port Angeles (when pilot is ordered and vessel proceeds without stopping for pilot.)	LOA Zone I	(b) Intraharbor shifts: Transportation to be paid both ways. If intraharbor shift is cancelled on or before scheduled reporting time, transportation paid one way only.	
Docking delay after anchoring:	\$ 85.00 per hr.	(c) Cancellation: Transportation both ways unless notice of cancellation is received prior to scheduled reporting time in which case transportation need only be paid one way.	
Applicable harbor shift rate to apply, plus \$85.00 per hour standby. No charge if delay is 60 minutes or less. If the delay is more than 60 minutes, charge is \$85.00 for every hour or fraction thereof.		(d) Any new facilities or other seldom used terminals, not covered above, shall be based on mileage x \$1.60 per mile.	
Sailing delay:	\$ 85.00 per hour	Delinquent payment charge: 1 1/2% per month after 45 days from first billing.	
No charge if delay is 60 minutes or less. If the delay is more than 60 minutes, charge is \$85.00 for every hour or fraction thereof.		Nonuse of pilots: Ships taking and discharging pilots without using their services through all Puget Sound and adjacent inland waters shall pay full pilotage fees on the LOA zone mileage basis from Port Angeles to destination, from place of departure to Port Angeles, or for entire distance between two ports on Puget Sound and adjacent inland waters.	
Slowdown:	\$ 85.00 per hour	LOA rate schedule	
When a vessel chooses not to maintain its normal speed capabilities for reasons determined by the vessel and not the pilot, and when the difference in arrival time is one hour, or greater, from the predicted arrival time had the vessel maintained its normal speed capabilities, a charge of \$85.00 per hour, and each fraction thereof, will be assessed for the resultant difference in arrival time.		The following rate schedule is based upon distances furnished by National Oceanic and Atmospheric Administration, computed to the nearest half-mile and includes retirement fund contributions.	
Super ships:			
20,000 to 50,000 gross tons: Additional charge to LOA zone mileage of \$0.0449 a gross ton for all gross tonnage in excess of 20,000 gross tons up to 50,000 gross tons.			
50,000 gross tons and up: In excess of 50,000 gross tons, the charge shall be \$0.0538 per gross ton.			
For vessels where a certificate of international gross tonnage is required, the appropriate international gross tonnage shall apply.			
Delayed arrival—Port Angeles:	\$ 85.00 per hour		
When a pilot is ordered for an arriving inbound vessel at Port Angeles and the vessel does not arrive within two hours of its ETA, or its ETA is amended less than six hours prior to the original ETA, a charge of \$85.00 for each hour delay, or fraction thereof, shall be assessed in addition to all other appropriate charges.			
Transportation to vessels on Puget Sound:			
March Point or Anacortes	\$ 112.00		
Bangor	65.00		
Bellingham	124.00		
Bremerton	34.00		
Cherry Point	146.00		
Dupont	65.00		
Edmonds	23.00		
Everett	42.00		
Ferndale	134.00		
Manchester	51.00		
Mukilteo	41.00		
Olympia	84.00		
Point Wells	23.00		
Port Gamble	60.00		
Port Townsend (Indian Island)	85.00		
Semiahmoo (Blaine)	153.00		
Tacoma	43.00		
Tacoma Smelter	49.00		
Winslow	34.00		
(a) Interport shifts: Transportation paid to and from both points.			

LOA	ZONE	ZONE	ZONE	ZONE	ZONE	ZONE
	I	II	III	IV	V	VI
	Intra Harbor	0-30 Miles	31-50 Miles	51-75 Miles	76-100 Miles	101 Miles & Over
Up to 449	127	198	344	515	695	904
450 - 459	129	203	347	523	705	907
460 - 469	133	206	350	531	716	911
470 - 479	138	210	355	543	719	914
480 - 489	141	215	357	552	724	917
490 - 499	144	217	361	562	731	922
500 - 509	150	221	367	570	737	928
510 - 519	152	226	371	577	744	931
520 - 529	154	234	377	580	751	940
530 - 539	160	237	382	586	763	949
540 - 549	163	241	389	593	776	958
550 - 559	166	248	392	602	782	967
560 - 569	172	258	400	607	790	977
570 - 579	175	262	404	609	797	983
580 - 589	183	266	411	614	803	994
590 - 599	191	271	414	618	814	1004
600 - 609	198	279	420	620	823	1010
610 - 619	209	282	427	624	832	1019
620 - 629	218	286	433	628	841	1030
630 - 639	229	292	437	630	848	1041
640 - 649	239	298	442	633	858	1048
650 - 659	254	304	449	638	867	1058
660 - 669	262	307	454	641	876	1066
670 - 679	269	314	459	652	886	1073
680 - 689	274	321	465	659	894	1083
690 - 699	282	326	470	671	904	1105
700 - 719	295	336	480	678	920	1119
720 - 739	312	347	491	687	940	1137
740 - 759	326	361	502	695	958	1157
760 - 779	339	376	513	705	977	1174
780 - 799	355	390	523	716	994	1194
800 - 819	369	404	533	721	1010	1211
820 - 839	382	417	545	731	1030	1226
840 - 859	399	434	556	739	1048	1247
860 - 879	412	449	567	760	1066	1264
880 - 899	427	464	577	777	1083	1283
900 - 919	440	477	587	795	1105	1301
920 - 939	455	491	602	814	1119	1319



LOA	ZONE	ZONE	ZONE	ZONE	ZONE	ZONE
	I	II	III	IV	V	VI
	Intra Harbor	0-30 Miles	31-50 Miles	51-75 Miles	76-100 Miles	101 Miles & Over
940 - 959	470	505	610	832	1137	1336
960 - 979	483	520	622	848	1157	1355
980 - 999	500	533	631	867	1174	1372
1000 & over	513	551	643	886	1194	1391

[Statutory Authority: RCW 88.13.035 [88.16.035]. 89-08-041 (Order 89-2, Resolution No. 89-2), § 296-116-300, filed 3/31/89. Statutory Authority: RCW 88.16.050. 88-05-039 (Order 88-1, Resolution No. 88-1), § 296-116-300, filed 2/16/88, effective 3/18/88. Statutory Authority: RCW 88.16.035(4). 87-01-081 (Orders 86-9 and 86-10, Resolution Nos. 86-9 and 86-10), § 296-116-300, filed 12/19/86; 86-19-066 (Order 86-6, Resolution No. 86-6), § 296-116-300, filed 9/16/86; 86-02-035 (Order 86-1, Resolution No. 86-1), § 296-116-300, filed 12/30/85; 85-02-048 (Order 84-5, Resolution No. 84-5), § 296-116-300, filed 12/31/84; 84-04-006 (Order 84-1, Resolution No. 84-1), § 296-116-300, filed 1/20/84; 83-17-055 (Order 83-6, Resolution No. 83-6), § 296-116-300, filed 8/17/83; 82-13-065 (Order 82-4, Resolution No. 82-4), § 296-116-300, filed 6/16/82. Statutory Authority: RCW 88.16.035. 81-12-017 (Order 81-2, Resolution No. 81-2), § 296-116-300, filed 5/29/81; 80-06-084 (Order 80-1, Resolution No. 80-1), § 296-116-300, filed 5/28/80. Statutory Authority: RCW 88.16.035(4). 79-07-033 (Order 79-4, Resolution No. 79-4), § 296-116-300, filed 6/19/79. Statutory Authority: Chapter 88.16 RCW and 1977 ex. sess. c 337, §§ 1 and 4. 78-02-008 (Order 78-1), § 296-116-300, filed 1/6/78, effective 2/10/78; Order 77-18, § 296-116-300, filed 9/20/77, effective 11/1/77; Order 76-24, § 296-116-300, filed 7/22/76; Order 75-3, § 296-116-300, filed 2/10/75; Order 74-2, § 296-116-300, filed 1/8/74; Order 73-8, § 296-116-300, filed 6/20/73 and Emergency Order 73-10, filed 7/19/73, effective 8/14/73; Order 70-7, § 296-116-300, filed 7/16/70; 7/25/67; 2/18/64; 10/29/62; 12/28/60; 3/23/60.]

**WAC 296-116-35001 Exemption from provisions of WAC 197-10-800.** The board of pilotage commissioners of the state of Washington has reviewed its authorized activities and found substantially all of them to be exempt from the provisions of chapter 197-10 WAC, with the exception of authority supplied by the 1975 legislature to the commission respecting additional tug shaft horsepower equivalencies which is a part of the "tug escort" 1975 amendments by chapter 125, Laws of 1975 1st ex. sess.

There is presently no intent to exercise this authority. Additionally, said act is currently under constitutional challenge. Thus, the commission indicates its intent that if, and when, any authority should be exercised pursuant to this provision, it would do so consistent with the guidelines contained within chapter 197-10 WAC insofar as practicable. (The referenced chapter being the regulations developed by the council on environmental policy.)

[Order 76-14, § 296-116-350 (codified as WAC 296-116-35001), filed 5/6/76.]

**WAC 296-116-360 Exempt vessels.** Under the authority of RCW 88.16.070, application may be made to the board of pilotage commissioners to seek exemption from the pilotage requirements for the operation of a limited class of small passenger vessels or yachts, which are not more than five hundred gross tons (international), do not exceed two hundred feet in length, and are operated exclusively in the waters of the Puget

Sound pilotage district and lower British Columbia. The owners or operators of such vessel or vessels must:

(1) Seek exemption at least sixty days prior to planned vessel operations in the Puget Sound pilotage district.

(2) Submit the petition requesting exemption to the chairperson, Washington state board of pilotage commissioners, with details concerning description of the vessel, the contemplated use of vessel, the proposed area of operation, the name and address of the vessel's owner, and the dates of planned operations. The board shall hold a hearing at a regularly scheduled board meeting to consider such exemption request.

The board, when granting such an exemption, may establish such conditions they deem necessary so that such an exemption shall not be detrimental to the public interest in regard to safe operation preventing loss of human lives, loss of property, and protecting the marine environment of the state of Washington.

One such condition shall be that the master of the vessel, shall at all times, hold as a minimum, a United States government license as a master near coastal of steam or motor vessel of not more than sixteen hundred gross tons (inspected vessel).

The board shall annually, or at any other time when in the public interest, review any exemptions granted to the specified class of small vessels to ensure that each exempted vessel remains in compliance with the original exemption and any conditions to the exemption. The board shall have the authority to revoke such exemption when there is not continued compliance with the requirements for exemption.

[Statutory Authority: RCW 88.16.070. 88-09-015 (Order 88-6, Resolution No. 88-6), § 296-116-360, filed 4/13/88.]

**WAC 296-116-370 System of specified disciplinary or corrective actions.** When a pilot has received multiple disciplinary actions pursuant to RCW 88.16.100 (1) and/or (2) within any two-year period, the board shall evaluate the pilot and prepare and personally serve upon him a notice advising of the board's intended action, the specific ground therefore, and the right to request a hearing pursuant to RCW 88.16.100(4) to challenge the board's action. Such intended action may include the temporary suspension of the pilot from duties until such pilot has satisfactorily completed subsection (1) or (2) of this section:

(1) An approved course-of-study which may include navigation training and testing; or

(2) Any remedial activity or treatment designated by the board to assure fitness and competence for full pilotage duties.

In ordering such disciplinary action, the board shall take into account both the causes of the previous disciplinary actions and the pilot's previous record.

Failure to enter into such corrective action within thirty days of the board's action may be cause for revocation of the pilot's license.

In the event of a temporary license suspension, license reinstatement and resumption of pilotage duties shall not be authorized until the board has reviewed completed



activity and formally extended approval. Such approval shall not be unreasonably withheld by the board and shall be reviewed and acted upon within five days of the completion of the activity.

[Statutory Authority: RCW 88.16.100. 88-14-062 (Order 88-14, Resolution No. 88-14), § 296-116-370, filed 7/1/88.]

**WAC 296-116-400 Procedure for request by steamship company or agent that certain pilots not be assigned to certain vessels for specific safety reasons.** When a steamship company or agent believes a particular pilot should not be assigned to pilot that company's vessels for specific safety reasons, a detailed written request, limited to specific safety concerns, may be submitted to the board. In order to be considered, the request must be submitted within ten days of the alleged act or omission causing their specific safety concern.

The board shall investigate the request and shall conduct a hearing at a regularly scheduled board meeting not more than sixty days following receipt of the request and notification of interested persons. The pilot shall be notified in writing and provided with documentation in accordance with WAC 296-11-450. The board shall notify the steamship company or agent and pilot in writing of its subsequent decision and reasons therefore.

In the event that the request is approved, the board shall give the affected pilot a specific list of vessels for which that pilot shall not provide pilotage services as well as the length of time covering such restriction.

[Statutory Authority: RCW 88.16.035. 88-09-016 (Order 88-7, Resolution No. 88-7), § 296-116-400, filed 4/13/88.]

**WAC 296-116-410 Definition of Grays Harbor pilotage district.** The Grays Harbor pilotage district shall have an outer boundary line between Grays Harbor and Willapa Harbor and the high seas which shall be seaward of a line from Point Brown rear range light to Grays Harbor entrance lighted whistle buoy number three, (latitude N 46-55.00, longitude 124-14.42 W), thence to Grays Harbor entrance lighted whistle buoy number two (latitude N 46-52.43, longitude 124-12.35 W), thence to Grays Harbor light and from the Willapa Bay light to the Willapa Bay approach lighted whistle buoy "W" (latitude N 46-41.50, longitude 124-10.46 W), thence to the charted northern-most position of Leadbetter Point.

[Statutory Authority: RCW 88.16.050. 88-09-017 (Order 88-8, Resolution No. 88-8), § 296-116-410, filed 4/13/88.]

**WAC 296-116-420 Summary/temporary license suspension.** Summary/temporary suspension of a pilot's license may be made by the chairperson or vice-chairperson of the board of pilotage commissioners when:

(1) A pilot has been involved in any vessel accident where there has been major property damage, loss of life, or loss of a vessel; or

(2) Where there is a reasonable cause to believe that a pilot has diminished capacity or is under the influence of drugs, alcohol, or other substances; and

(3) Such an accident or physical or mental impairment would significantly diminish that pilot's ability to

carry out pilotage duties and that the public health, safety, and welfare requires such emergency action. Notification of this suspension shall be made directly to the pilot and the appropriate pilot's association.

Within seventy-two hours an emergency board meeting will be held to determine whether to continue such suspension. In the event the suspension is continued pending proceedings for revocation or other action, an order shall be immediately prepared and notice shall be personally served upon the pilot advising of the board's action.

These further proceedings shall be promptly instituted in the office of administrative hearings.

All final decisions of the administrative law judge shall be subject to review by the superior court of the state of Washington for Thurston County or by the superior court of the county in which the pilot maintains his residence or principal place of business, to which court any case with all the papers and proceedings therein shall be immediately certified by the administrative law judge if requested to do so by any party to the proceedings at any time within thirty days after the date of such final decision. No appeal may be taken after the expiration of thirty days after the date of final decision.

[Statutory Authority: RCW 88.16.100. 88-10-040 (Order 88-12, Resolution No. 88-12), § 296-116-420, filed 5/3/88.]

## Chapter 296-124 WAC

### RULES AND REGULATIONS FOR THE ADMINISTRATION OF THE THEATRICAL ENTERPRISE ACT

#### WAC

296-124-010	Definitions.
296-124-020	Bond or cash deposit.
296-124-021	Statement of intent to hire.
296-124-022	Filing claim for wages against bond or cash deposit.
296-124-040	Multiple events.
296-124-050	Failure to post bond.

**WAC 296-124-010 Definitions.** As used in this chapter:

(1) "Theatrical enterprise" means the production of any circus, vaudeville, carnival, revue, variety show, musical comedy, operetta, opera, drama, endurance contest, marathon, walkathon, or any other entertainment event where persons are a part of the enterprise's presentation. Theatrical enterprise does not include a program of a radio or television station operating pursuant to a license issued by the Federal Communications Commission or any event produced by a nonprofit cultural or artistic organization that has been located in a community for at least two years.

(2) "Department" means the department of labor and industries.

(3) "Director" means the director of the department of labor and industries or his duly authorized deputy or representative.

(4) "Assistant director" means the supervisor of industrial relations for the department of labor and industries or his duly authorized deputy or representative.

(5) "Promoter" includes any individual, firm, partnership, association or corporation giving employment to individuals involved with the production of a theatrical enterprise.

(6) "Employee" means an employee who is employed in the business of his employer whether by way of manual labor or otherwise.

[Statutory Authority: RCW 49.38.070. 85-03-065 (Order 85-4), § 296-124-010, filed 1/16/85.]

**WAC 296-124-020 Bond or cash deposit.** (1) Any persons engaged in the business of promoting a theatrical enterprise in this state shall deposit with the department the cash or bond issued by a surety company authorized to do business in this state in an amount determined sufficient by the department to pay the wages of every person involved in the production of the theatrical enterprise for the period for which a single payment of wages is made, but not to exceed one week.

(2) The deposit required under subsection (1) of this section shall be on file with the department seven calendar days before the commencement of the theatrical enterprise.

(3) The deposit required under subsection (1) shall be in existence for a period of at least one year after conclusion of the event.

(4) A cash deposit may be made with the department in lieu of a bond.

(5) An assigned savings account may be left with the department in lieu of the bond.

[Statutory Authority: RCW 49.38.070. 85-03-065 (Order 85-4), § 296-124-020, filed 1/16/85.]

**WAC 296-124-021 Statement of intent to hire.** In addition to the bond or cash deposit there shall be filed, on a form supplied by the department, a notarized statement of intent to hire which shall include:

(1) Name and address (current and permanent) of the person(s) promoting the theatrical enterprise.

(2) The promoters' bank account location.

(3) Proof of the promoters' industrial insurance coverage for workers.

(4) Name of event sponsor, if applicable.

(5) Date, time period and location of event.

(6) Classification of workers employed.

(7) Approximate number of workers and hourly rate to be paid each classification of workers.

(8) Total estimate of weekly payroll for the event.

(9) Copy of this intent shall be on file at the site of the event.

[Statutory Authority: RCW 49.38.070. 85-03-065 (Order 85-4), § 296-124-021, filed 1/16/85.]

**WAC 296-124-022 Filing claim for wages against bond or cash deposit.** An employee may make claim against bond or cash deposit by:

(1) Filing suit in superior or district court in the county where the event was performed or where employer or principle owner resides; and,

(1989 Ed.)

(2) The employee shall file notice of court action with the department within 20 days of the conclusion of the suit; or,

(3) An employee may file a wage claim assignment with the department in accordance with RCW 49.48.040 within 90 days of the conclusion of the event.

[Statutory Authority: RCW 49.38.070. 85-03-065 (Order 85-4), § 296-124-022, filed 1/16/85.]

**WAC 296-124-040 Multiple events.** In the case of multiple events only one bond or cash deposit and statement of intent to hire must be filed by the promoter, providing that the bond or cash deposit and other information required by this chapter is sufficient for all events covered.

[Statutory Authority: RCW 49.38.070. 85-03-065 (Order 85-4), § 296-124-040, filed 1/16/85.]

**WAC 296-124-050 Failure to post bond.** Failure to conform with provisions of these regulations may result in the department bringing legal action to cause compliance and/or the closure of the business.

[Statutory Authority: RCW 49.38.070. 85-03-065 (Order 85-4), § 296-124-050, filed 1/16/85.]

**Chapter 296-125 WAC**

**ISSUANCE OF MINOR WORK PERMITS**

**WAC**

- 296-125-010 Applicability.
- 296-125-015 Definitions.
- 296-125-020 Filing of application for permits to employ minors.
- 296-125-023 Posting.
- 296-125-027 Hours of work, meals and rest periods for minors.
- 296-125-030 Prohibited and hazardous employment.
- 296-125-033 Special restrictions for minors under the age of 16.
- 296-125-043 Minimum wages—Minors.
- 296-125-050 Recordkeeping.
- 296-125-055 Revocation of permits.
- 296-125-060 Variances.
- 296-125-110 Applicability.
- 296-125-115 Definitions.
- 296-125-120 Filing of registration certificate.
- 296-125-125 Application for initial and renewed registration.
- 296-125-130 Posting.
- 296-125-135 Identification cards.
- 296-125-140 House to house employment standards.
- 296-125-145 Transporting minors out-of-state.
- 296-125-155 Recordkeeping.
- 296-125-160 Revocation of registration certificate.
- 296-125-165 Denial of registration certificate.
- 296-125-170 Employment of minors under the age of sixteen.
- 296-125-175 Length of registration period.

**DISPOSITION OF SECTIONS FORMERLY CODIFIED IN THIS CHAPTER**

- 296-125-025 Conditions governing issuance of permits. [Order 74-9, § 296-125-025, filed 3/13/74, effective 4/15/74; Order 71-5, § 296-125-025, filed 5/26/71, effective 7/1/71; Section D, filed 9/18/63; Rules (part), filed 3/12/60.] Repealed by Order 76-15, filed 5/17/76.
- 296-125-035 Working conditions. [Section F, filed 9/18/63; Rules (part), filed 3/23/60.] Repealed by Order 71-5, filed 5/26/71, effective 7/1/71.
- 296-125-040 Issuance of permit. [Order 71-5, § 296-125-040, filed 5/26/71, effective 7/1/71; Section G, filed

9/18/63; Rules (part), filed 3/23/60.] Repealed by Order 76-15, filed 5/17/76.  
 296-125-045 Denial of permit. [Order 71-5, § 296-125-045, filed 5/26/71, effective 7/1/71; Section H, filed 9/18/63.] Repealed by Order 76-15, filed 5/17/76.

**WAC 296-125-010 Applicability.** Unless exempted by Washington state or federal law, every employer who employs one or more minor workers on and after the effective date of these regulations must previously have obtained a valid permit to employ minors from the state division of industrial relations, department of labor and industries.

[Order 76-15, § 296-125-010, filed 5/17/76; Order 74-9, § 296-125-010, filed 3/13/74, effective 4/15/74; Order 71-5, § 296-125-010, filed 5/26/71, effective 7/1/71; Section A, filed 9/18/63; Rules (part), filed 3/23/60.]

**WAC 296-125-015 Definitions.** For the purposes of this chapter:

(1) A "minor" is a person of either sex who is under the age of 18 years.

(2) "Employ" means to engage, suffer or permit to work.

(3) "Employee" means any minor employed by an employer.

(4) "Employer" means any person, association, partnership, private or public corporation who employs or exercises control over the wages, hours or working conditions of a minor.

(5) "Division" means employment standards, apprenticeship and crime victims division, Washington state department of labor and industries.

[Statutory Authority: RCW 43.22.270 and 1989 c 216. 89-23-003, § 296-125-015, filed 11/3/89, effective 11/20/89; Order 76-15, § 296-125-015, filed 5/17/76; Order 74-9, § 296-125-015, filed 3/13/74, effective 4/15/74; Order 71-5, § 296-125-015, filed 5/26/71, effective 7/1/71; Section B, filed 9/18/63; Rules (part), filed 3/23/60.]

**WAC 296-125-020 Filing of application for permits to employ minors.** Prior to the employment of one or more minors, each employer shall file with the division or its authorized agent an application for a permit to employ minors within a specified work place. When validated by the signature of the division's supervisor of employment standards, such a permit will authorize the employer to employ any number of minor workers in the specified work place in accordance with the conditions established below.

[Order 76-15, § 296-125-020, filed 5/17/76; Order 71-5, § 296-125-020, filed 5/26/71, effective 7/1/71; Section C, filed 9/18/63; Rules (part), filed 3/23/60.]

**WAC 296-125-023 Posting.** At least one copy of a valid permit to employ minors must be posted in plain view of all employees within the confines of the work place specified in the permit.

[Order 76-15, § 296-125-023, filed 5/17/76.]

**WAC 296-125-027 Hours of work, meals and rest periods for minors.** (1) Minors under age 16 may not be

[Title 296 WAC—p 1806]

employed during school hours (except by special permission from school officials as outlined in RCW 28A.27.010 and 28A.27.090) nor before 7 a.m. nor after 7 p.m. during the school year, nor after 9 p.m. during the summer vacation season.

(2) Minors under age 16 may not be employed more than three hours per day on school days, nor more than 18 hours per week during school weeks.

(3) No minor shall be employed more than eight hours per day nor more than five days in any one week. Minors employed past 8 p.m. in service occupations must be supervised by a responsible adult who is required to be on the premises.

(4) No minor shall be employed on consecutive nights, both of which precede a school day, unless working no later than 9:00 p.m.

(5) No minor shall be employed more than five hours without a meal period of at least 30 minutes.

(6) Every minor employee shall be given a rest period of at least 10 minutes in every 4-hour period of employment, except as otherwise provided in WAC 296-126-092.

[Order 76-15, § 296-125-027, filed 5/17/76.]

**WAC 296-125-030 Prohibited and hazardous employment.** (1) The following employments are prohibited for all minors, unless specifically permitted in the text of the hazardous occupations orders in nonagricultural occupations of the child labor provisions of the Federal Fair Labor Standards Act, as now or hereafter amended.

(a) Occupations in or about plants or establishments manufacturing or storing explosives or articles containing explosive components.

(b) Occupations involving regular driving of motor vehicles. Occasional driving is permissible if: The minor has a valid state driver's license for the type of driving involved; driving is restricted to daylight hours, vehicle gross weight is under 6,000 pounds; the minor has completed a state-approved driver education course; and seat belts are provided in the vehicle and the minors have been instructed to use them.

(c) All mining operations.

(d) Logging occupations and occupations in the operation of any sawmill, lath mill, shingle mill, or cooper-age-stock mill.

(e) Occupations involving operation of power-driven wood-working machines, power-driven metal-forming punching and shearing machines, power-driven bakery machines, power-driven paper products machines, circular saws, band-saws and guillotine shears, elevators and other power-driven hoisting apparatus.

(f) Occupations involving potential exposure to radioactive substances and to ionizing radiations.

(g) Occupations involving slaughtering, meat-packing or processing and rendering.

(h) Occupations involving wrecking, demolition and shipbreaking operations.

(i) All roofing operations.

(j) Occupations involving excavations.

(k) Occupations involving manufacturing of brick, tile and kindred products.

(2) The following types of work are prohibited for all minors:

- (a) Work involving operation of or working in proximity to earth-moving machines, cranes, garbage compactors or other heavy equipment of similar nature.
- (b) Work in establishments or work places being picketed during the course of a labor dispute.
- (c) Work as a nurses' aide, unless the minor is a student in a bona fide nursing training program or has successfully completed such a program.
- (d) Work as a maid or bell-hop in motels or hotels, unless the minor is accompanied by a responsible adult whenever the work requires the minor to enter assigned guest rooms.
- (e) Work in shooting galleries, penny arcades, sauna-massage parlors or body painting studios.

[Statutory Authority: RCW 43.22.270 and 1989 c 216. 89-23-003, § 296-125-030, filed 11/3/89, effective 11/20/89; Order 77-32, § 296-125-030, filed 12/30/77; Order 76-15, § 296-125-030, filed 5/17/76; Order 74-9, § 296-125-030, filed 3/13/74, effective 4/15/74; Order 71-5, § 296-125-030, filed 5/26/71, effective 7/1/71; Section E, filed 9/18/63; Rules (part), filed 3/23/60.]

**WAC 296-125-033 Special restrictions for minors under the age of 16.** Employment of minors under age 16 is subject to the following additional restrictions. They are prohibited from working:

- (1) In any manufacturing occupation.
- (2) In any processing operations (such as filleting of fish, dressing poultry, cracking nuts, commercial processing, canning, freezing or drying of foods, laundering as performed by commercial laundries and dry cleaning).
- (3) In work rooms or work places where goods are manufactured, mined or otherwise processed.
- (4) In any public messenger service.
- (5) In occupations connected with transportation, warehouse and storage, communications and public utilities, or construction. (Office or sales work related to these occupations is permitted if none of the minor's work is performed on the transportation media or construction site.)
- (6) In occupations requiring operation or tending of any power-driven machinery or hoisting apparatus.
- (7) In the following specific areas of retail, food service or gasoline service station operations:
  - (a) Work performed in or about boiler or engine rooms.
  - (b) Maintenance or repair work.
  - (c) Outside window washing or other work requiring worker to be positioned at higher than ground level.
  - (d) Cooking and baking.
  - (e) Operating, setting up, adjusting, cleaning, oiling or repairing power-driven food slicers and grinders, food choppers and cutters and bakery-type mixers.
  - (f) Work in freezers, meat coolers and all work in preparing meats for sale. (Wrapping, sealing, labeling, weighing, pricing and stocking are permitted if work is performed away from meat-cutting and preparation areas.)
  - (g) Loading and unloading goods to or from trucks, railroad cars or conveyors.

[Order 76-15, § 296-125-033, filed 5/17/76.]

**WAC 296-125-043 Minimum wages--Minors.** Except where a higher minimum wage is required by Washington state or federal law:

(1) Every employer shall pay to each of his or her employees who have reached their sixteenth or seventeenth year of age a rate of pay per hour which is equal to the hourly rate required by RCW 49.46.020 for employees eighteen years of age or older, whether computed on an hourly, commission, piecework, or other basis, except as may be otherwise provided under this chapter.

(2) Every employer shall pay to each of his or her employees who have not reached their sixteenth year of age a rate of pay per hour that is not less than eighty-five percent of the hourly rate required by RCW 49.46.020 for employees eighteen years of age or older whether computed on an hourly, commission, piecework, or other basis, except as may be otherwise provided under this chapter.

(3) These provisions shall not apply to handicapped minors for whom special handicapped minor work permits have been issued as provided in RCW 49.12.110. The handicapped rate therein shall be set at a rate designed to adequately reflect the individual's earning capacity.

(4) These minimum wage provisions shall not apply when a minor student is in a work place to carry out an occupational training experience assignment directly supervised on the premises by a school official or an employer under contract with a school and when no appreciable benefit is rendered to the employer by the presence of the minor student.

[Statutory Authority: RCW 43.22.270 and 1988 c 236. 89-10-014 (Order 88-32), § 296-125-043, filed 4/24/89, effective 6/1/89; Order 76-15, § 296-125-043, filed 5/17/76.]

**WAC 296-125-050 Recordkeeping.** The employer shall be responsible for obtaining and keeping on file the following information concerning each minor employee:

- (1) Proof of age by means of a copy of one of the following: Birth certificate; driver's license, baptismal record; Bible record; insurance policy at least one year old indicating birth date; or witnessed statement of parent or guardian.
- (2) Personal data relating to the minor, including: Name and address and sex.
- (3) Description of employment: Earliest and latest hours of employment; descriptions of specific meal and rest periods; and complete description of duties.
- (4) Parental authorization for employment by signature of parent or guardian on a form provided by the division.
- (5) School authorization for employment during any part of the school year, on a form provided by the division.
- (6) The employer shall make any or all of the above information available to the division or any of its authorized agents upon request.

[Order 76-15, § 296-125-050, filed 5/17/76; Order 71-5, § 296-125-050, filed 5/26/71, effective 7/1/71; Section I, filed 9/18/63; Rules (part), filed 3/23/60.]

**WAC 296-125-055 Revocation of permits.** The division or its authorized agent may revoke any employer's permit to employ minors upon a showing that the conditions of its issuance are not being met, or that other conditions exist which are detrimental to the health, safety or welfare of the minor.

[Order 76-15, § 296-125-055, filed 5/17/76; Order 71-5, § 296-125-055, filed 5/26/71, effective 7/1/71; Section J, filed 9/18/63; Rules (part), filed 3/23/60.]

**WAC 296-125-060 Variances.** Variances permitting specific employment of minors in occupations prohibited by these rules may be granted in accordance with procedures outlined in WAC 296-126-130.

[Order 76-15, § 296-125-060, filed 5/17/76.]

**WAC 296-125-110 Applicability.** Unless exempted by Washington state or federal law every employer who, after the effective date of these regulations, employs one or more minor workers in house to house sales or advertises to employ persons in house to house sales specifying in the advertisement a minimum age under twenty-one years, shall have a valid registration certificate to employ minors from the employment standards, apprenticeship and crime victims division, department of labor and industries.

[Statutory Authority: RCW 43.22.270 and 1989 c 216. 89-23-003, § 296-125-110, filed 11/3/89, effective 11/20/89.]

**WAC 296-125-115 Definitions.** For the purposes of WAC 296-125-110 through 296-125-175:

(1) "Employ" means to engage, suffer, or permit to work, but does not include voluntary or donated services performed for no compensation, or without expectation or contemplation of compensation as the adequate consideration for the services performed, for an educational, charitable, religious, state or local government body or agency, or nonprofit organization, or services performed by a newspaper vendor or carrier or a person in the employment of his or her parent or stepparent.

(2) "House to house sales" means a sale or other transaction in consumer goods, the demonstration of products or equipment, the obtaining of orders for consumer goods, or the obtaining of contracts for services, in which the employee personally solicits the sale or transaction at a place other than the place of business of the employer or the residence of the employee.

[Statutory Authority: RCW 43.22.270 and 1989 c 216. 89-23-003, § 296-125-115, filed 11/3/89, effective 11/20/89.]

**WAC 296-125-120 Filing of registration certificate.** Prior to the employment of one or more minors, each employer seeking to employ minors in house to house sales shall file with the division an application for a registration certificate. When validated by the signature of the division's supervisor of employment standards, such a registration certificate will authorize the employer to

employ any number of minor workers in house to house sales in accordance with the conditions established.

[Statutory Authority: RCW 43.22.270 and 1989 c 216. 89-23-003, § 296-125-120, filed 11/3/89, effective 11/20/89.]

**WAC 296-125-125 Application for initial and renewed registration.** (1) To obtain a registration certificate, an employer must:

(a) Complete an application for a registration certificate on a form provided by the department.

(b) Supply the information required by WAC 296-125-145 if the employer seeks to transport minors out of the state.

(c) Applications for issuance or renewal of a registration certificate must be sent to:

Department of Labor  
& Industries  
ESAC Division  
Mailstop: HC-710  
Olympia, WA 98504

(2) The department shall send a renewal notice to the employer's last recorded address at least forty-five days before the employer's registration certificate expires. Except as provided in WAC 296-125-165, a registration certificate shall be renewed if the employer returns the renewal notice and provides all required information.

[Statutory Authority: RCW 43.22.270 and 1989 c 216. 89-23-003, § 296-125-125, filed 11/3/89, effective 11/20/89.]

**WAC 296-125-130 Posting.** At least one copy of the registration certificate must be posted in plain view of all employees within the confines of the work place specified in the registration certificate.

[Statutory Authority: RCW 43.22.270 and 1989 c 216. 89-23-003, § 296-125-130, filed 11/3/89, effective 11/20/89.]

**WAC 296-125-135 Identification cards.** (1) Every employer shall provide an identification card to each minor employee employed in house to house sales in a form prescribed by the director.

(2) Every minor employee employed in house to house sales shall show the identification card to each customer or potential customer.

(3) An identification card shall be in the possession of each minor employee during all work hours.

[Statutory Authority: RCW 43.22.270 and 1989 c 216. 89-23-003, § 296-125-135, filed 11/3/89, effective 11/20/89.]

**WAC 296-125-140 House to house employment standards.** In addition to the requirements of WAC 296-125-027,

(1) Minors may not be employed in house to house sales during school hours, nor before 7:00 a.m. nor after 9:00 p.m.

(2) During all work hours, minors employed in house to house sales must be supervised by a responsible adult who is at least twenty-one years of age, with each supervisor responsible for no more than five minor employees.

[Statutory Authority: RCW 43.22.270 and 1989 c 216. 89-23-003, § 296-125-140, filed 11/3/89, effective 11/20/89.]

**WAC 296-125-145 Transporting minors out-of-state.** Prior to transporting minor employees employed in house to house sales out of the state, every employer shall obtain written authorization from the minor's parents or legal guardian.

[Statutory Authority: RCW 43.22.270 and 1989 c 216. 89-23-003, § 296-125-145, filed 11/3/89, effective 11/20/89.]

**WAC 296-125-155 Recordkeeping.** The employer shall be responsible for obtaining and keeping on file all information as required in WAC 296-125-050 and 296-125-145. The records shall be made available for inspection and copying at the request of the department.

[Statutory Authority: RCW 43.22.270 and 1989 c 216. 89-23-003, § 296-125-155, filed 11/3/89, effective 11/20/89.]

**WAC 296-125-160 Revocation of registration certificate.** The supervisor of employment standards may revoke any employer's registration certificate upon a showing that the conditions of its issuance are not being met, or that other conditions exist which are detrimental to the health, safety, or welfare of the minor.

[Statutory Authority: RCW 43.22.270 and 1989 c 216. 89-23-003, § 296-125-160, filed 11/3/89, effective 11/20/89.]

**WAC 296-125-165 Denial of registration certificate.** The department may refuse to issue or renew a registration certificate. If the department refuses to issue or renew a registration certificate for any reason, it shall serve on the employer a notice of denial. The notice of denial shall explain the grounds for denial of the certificate. The department may refuse to renew a registration certificate if the conditions of its initial issuance are not being met.

[Statutory Authority: RCW 43.22.270 and 1989 c 216. 89-23-003, § 296-125-165, filed 11/3/89, effective 11/20/89.]

**WAC 296-125-170 Employment of minors under the age of sixteen.** Minors under the age of sixteen are prohibited from employment in house to house sales unless a variance is granted, consistent with all other requirements of this chapter, in accordance with procedures outlined in WAC 296-126-130.

[Statutory Authority: RCW 43.22.270 and 1989 c 216. 89-23-003, § 296-125-170, filed 11/3/89, effective 11/20/89.]

**WAC 296-125-175 Length of registration period.** Registration certificates shall be issued for a one-year period.

[Statutory Authority: RCW 43.22.270 and 1989 c 216. 89-23-003, § 296-125-175, filed 11/3/89, effective 11/20/89.]

## Chapter 296-126 WAC

### STANDARDS OF LABOR FOR THE PROTECTION OF THE SAFETY, HEALTH AND WELFARE OF EMPLOYEES FOR ALL OCCUPATIONS SUBJECT TO CHAPTER 49.12 RCW

#### WAC

296-126-001	Applicability.
296-126-002	Definitions.
296-126-010	Minimum wages—Adults.
296-126-020	Minimum wages—Minors.
296-126-021	Minimum wages—Commissions and piecework.
296-126-022	Gratuities.
296-126-023	Payment interval.
296-126-025	Deductions.
296-126-040	Statements furnished.
296-126-050	Employment records.
296-126-060	Minor work permits.
296-126-070	Prohibited action.
296-126-080	Posting of order.
296-126-090	Hours.
296-126-092	Meal periods—Rest periods.
296-126-094	General duty—Working conditions.
296-126-096	Lifting.
296-126-098	Wearing apparel.
296-126-130	Variance.
296-126-140	Appeal procedures.
296-126-200	Applicability.
296-126-202	Definitions.
296-126-204	Minimum wage.
296-126-206	Limitation on number of employees paid in Counselor I and Counselor II rates.
296-126-208	Premium pay for resident counselor staff occupations.
296-126-210	Board, lodging, and other services.
296-126-212	Travel expenses.
296-126-214	Records.
296-126-216	Agreements.
296-126-218	Work permits.
296-126-220	Minors' occupations.
296-126-222	Sanitation and safety.
296-126-224	Wearing apparel.
296-126-226	Penalties.

Reviser's note: For industrial welfare committee appeal procedures, see also chapter 296-129 WAC.

**WAC 296-126-001 Applicability.** These standards, adopted pursuant to the authority of chapter 49.12 RCW as amended by chapter 16, Laws of 1973 2nd ex. sess., shall apply to any person employed in any industry or occupation within the state of Washington, unless:

(1) Exempted by the provisions of chapter 49.12 RCW (newspaper vendors or carriers, domestic or casual labor in or about private residences, agricultural labor as defined in RCW 50.04.150, as now or hereafter amended, and sheltered workshops, are all exempt from these provisions);

(2) Otherwise exempted in rules and regulations adopted by the industrial welfare committee of the state of Washington;

(3) Exempted by a variance issued under the provisions in WAC 296-126-130;

(4) Such person is an employee of the state or any political subdivision, or municipal corporation to the extent that these rules conflict with any statute, rule or regulation adopted under the authority of the appropriate legislative body.

[Order 74-9, § 296-126-001, filed 3/13/74, effective 4/15/74.]



**WAC 296-126-002 Definitions.** (1) "Employer" means any person, firm, corporation, partnership, business trust, legal representative, or other business entity which engages in any business, industry, profession, or activity in this state and employs one or more employees, unless exempted by chapter 49.12 RCW or these rules.

(2) "Employee" means an employee who is employed in the business of his employer whether by way of manual labor or otherwise. This definition is not intended, for purposes of these regulations, to include: Any individual registered as a volunteer with a state or federal volunteer program or any person who performs any assigned or authorized duties for an educational, religious, governmental or nonprofit charitable corporation by choice and receives no payment other than reimbursement for actual expenses necessarily incurred in order to perform such volunteer services; any individual employed in a bona fide executive, administrative or professional capacity or in the capacity of commissioned outside salesperson; nor is it intended to include independent contractors where said individuals control the manner of doing the work and the means by which the result is to be accomplished.

(3) "Employ" means to engage, suffer or permit to work.

(4) "Adult" means any person of either sex, eighteen years of age or older.

(5) "Minor" means any person of either sex under eighteen years of age.

(6) "Student learner" means a person enrolled in a bona fide vocational training program accredited by a national or regional accrediting agency recognized by the United States Office of Education, or authorized and approved by the Washington state commission for vocational education, who may be employed part time in a definitely organized plan of instruction.

(7) "Learner" means a worker whose total experience in an authorized learner occupation is less than the period of time allowed as a learning period for that occupation in a learner certificate issued by the director pursuant to regulations of the department of labor and industries.

(8) "Hours worked" shall be considered to mean all hours during which the employee is authorized or required by the employer to be on duty on the employer's premises or at a prescribed work place.

(9) "Conditions of labor" shall mean and include the conditions of rest and meal periods for employees including provisions for personal privacy, practices, methods and means by or through which labor or services are performed by employees and includes bona fide physical qualifications in employment, but shall not include conditions of labor otherwise governed by statutes and rules and regulations relating to industrial safety and health administered by the department.

(10) "Committee" shall mean the industrial welfare committee as provided by law. The committee's secretary is the supervisor of employment standards in care of the Department of Labor and Industries, General Administration Building, Olympia, Washington 98504.

[Order 76-15, § 296-126-002, filed 5/17/76; Order 74-9, § 296-126-002, filed 3/13/74, effective 4/15/74.]

**WAC 296-126-010 Minimum wages—Adults.** Except where a higher minimum wage is required by Washington state or federal law, (1) every employer shall pay to each of his or her adult employees wages at a rate of not less than one dollar and eighty cents per hour, and effective January 1, 1975, not less than two dollars per hour, whether computed on an hourly commission, piecework or other basis, except as may be otherwise provided by law or regulation.

(2) These provisions shall not apply to outside commissioned salespersons; or to trainees, learners, student learners, apprentices or handicapped persons for whom special certificates or special permits have been issued as set forth in RCW 49.12.110. These special rates shall be computed as follows: Learners — 85% of the applicable minimum wage; student-learner — 75% of the applicable minimum rate; handicapped — at a rate designed to reflect adequately the individual's earning capacity.

[Order 74-9, § 296-126-010, filed 3/13/74, effective 4/15/74.]

**WAC 296-126-020 Minimum wages—Minors.** Except where a higher minimum wage is required by Washington state or federal law:

(1) Every employer shall pay to each of his or her employees who have reached their sixteenth or seventeenth year of age a rate of pay per hour which is equal to the hourly rate required by RCW 49.46.020 for employees eighteen years of age or older, whether computed on an hourly, commission, piecework, or other basis, except as may be otherwise provided under this chapter.

(2) Every employer shall pay to each of his or her employees who have not reached their sixteenth year of age a rate of pay per hour that is not less than eighty-five percent of the hourly rate required by RCW 49.46.020 for employees eighteen years of age or older whether computed on an hourly, commission, piecework, or other basis, except as may be otherwise provided under this chapter.

(3) These provisions shall not apply to handicapped minors for whom special handicapped minor work permits have been issued as provided in RCW 49.12.110. The handicapped rate therein shall be set at a rate designed to adequately reflect the individual's earning capacity.

[Statutory Authority: RCW 43.22.270 and 1988 c 236. 89-10-014 (Order 88-32), § 296-126-020, filed 4/24/89, effective 6/1/89; Order 74-9, § 296-126-020, filed 3/13/74, effective 4/15/74.]

**WAC 296-126-021 Minimum wages—Commissions and piecework.** Where employees are paid on a commission or piecework basis, wholly or partially, (1) the amount earned on such basis in each work-week period may be credited as a part of the total wage for that period; and

(2) The total wages paid for such period shall be computed on the hours worked in that period resulting in no less than the applicable minimum wage rate.



[Order 74-9, § 296-126-021, filed 3/13/74, effective 4/15/74.]

**WAC 296-126-022 Gratuities.** For the purposes of these regulations, gratuities received by employees shall not be considered a part of the minimum wage.

[Order 74-9, § 296-126-022, filed 3/13/74, effective 4/15/74.]

**WAC 296-126-023 Payment interval.** All wages due shall be paid at no longer than monthly intervals to each employee on established regular pay days. To facilitate bookkeeping, an employer may implement a regular payroll system in which wages from up to seven days before pay day may be withheld from the pay period covered and included in the next pay period.

[Statutory Authority: RCW 43.22.270, 49.12.020, 49.12.091, 49.12.050, 49.46.020 and 49.46.070. 89-22-016 (Order 89-16), § 296-126-023, filed 10/24/89, effective 11/24/89; Order 74-9, § 296-126-023, filed 3/13/74, effective 4/15/74.]

**WAC 296-126-025 Deductions.** Except as otherwise provided by law, no employer shall make any deduction from the wage of an employee:

(1) For any cash shortage, walkout (failure of customer to pay), breakage, or loss of equipment, unless it can be shown that the shortage, walkout, breakage or loss was caused by a dishonest or willful act of the employee.

(2) For acceptance of a bad check, unless it can be shown that the employee accepted such a check in violation of procedures previously made known to him or her by the employer.

(3) For any cash shortage from a cash register, drawer or portable depository provided for that purpose, unless the employee has sole access to the cash and has participated in the cash accounting at the beginning of his or her shift and again at the end of said shift. Where a portable cash depository is in use the employer shall provide for periodic withdrawals of cash receipts during the shift to prevent large accumulations of cash.

[Order 74-9, § 296-126-025, filed 3/13/74, effective 4/15/74.]

**WAC 296-126-040 Statements furnished.** Every employer shall furnish to each employee at the time of payment of wages an itemized statement showing the pay basis (i.e., hours or days worked), rate or rates of pay, gross wages and all deductions therefrom for that pay period.

[Order 74-9, § 296-126-040, filed 3/13/74, effective 4/15/74.]

**WAC 296-126-050 Employment records.** (1) Every employer shall keep for at least three years a record of the name, address, and occupation of each employee, dates of employment, rate or rates of pay, amount paid each pay period to each such employee and the hours worked.

(2) Every employer shall make the record described in subsection (1) available to the employee, upon request, at any reasonable time.

(3) Every employer shall, upon written request by the employee, furnish within ten working days of the request to each employee who is discharged a signed written

statement, setting forth the reasons for such discharge and the effective date thereof.

[Statutory Authority: RCW 43.22.270, 49.12.020, 49.12.091, 49.12.050, 49.46.020 and 49.46.070. 89-22-016 (Order 89-16), § 296-126-050, filed 10/24/89, effective 11/24/89; Order 74-9, § 296-126-050, filed 3/13/74, effective 4/15/74.]

**WAC 296-126-060 Minor work permits.** No minor shall be employed in any occupation or industry unless the employer shall have on file during the period of employment an unexpired work permit issued pursuant to section 15, chapter 16, Laws of 1973 2nd ex. sess., and regulations implementing said section in chapter 296-125 WAC. Such permit will not be issued except upon presentation of such evidence of age as is required by the industrial welfare committee.

[Order 74-9, § 296-126-060, filed 3/13/74, effective 4/15/74.]

**WAC 296-126-070 Prohibited action.** No employer shall discharge or in any other way discriminate against or penalize any employee who seeks information or a hearing concerning variance requests by an employer or information concerning employment standards, or who has filed a complaint alleging a violation of any employment standard.

[Order 74-9, § 296-126-070, filed 3/13/74, effective 4/15/74.]

**WAC 296-126-080 Posting of order.** The employer shall keep posted a current copy of these regulations in a form provided by the department. The poster shall be positioned in a readily accessible location and within plain view in each work site where an employee or employees are employed.

[Order 74-9, § 296-126-080, filed 3/13/74, effective 4/15/74.]

**WAC 296-126-090 Hours.** Any employee who feels the number of hours or other matters relating to overtime employment are detrimental to the health, safety or welfare of the employee may request the department of labor and industries to make an investigation following which the department will issue findings and conclusions. Whenever the circumstances are found to be detrimental to the health, safety or welfare of the employee, the industrial welfare committee may adopt additional or revised employment standards.

[Order 76-15, § 296-126-090, filed 5/17/76.]

**WAC 296-126-092 Meal periods--Rest periods.** (1) Employees shall be allowed a meal period of at least 30 minutes which commences no less than two hours nor more than five hours from the beginning of the shift. Meal periods shall be on the employer's time when the employee is required by the employer to remain on duty on the premises or at a prescribed work site in the interest of the employer.

(2) No employee shall be required to work more than five consecutive hours without a meal period.

(3) Employees working three or more hours longer than a normal work day shall be allowed at least one 30-minute meal period prior to or during the overtime period.

(4) Employees shall be allowed a rest period of not less than 10 minutes, on the employer's time, for each 4 hours of working time. Rest periods shall be scheduled as near as possible to the midpoint of the work period. No employee shall be required to work more than three hours without a rest period.

(5) Where the nature of the work allows employees to take intermittent rest periods equivalent to 10 minutes for each 4 hours worked, scheduled rest periods are not required.

[Order 76-15, § 296-126-092, filed 5/17/76.]

**WAC 296-126-094 General duty--Working conditions.** It shall be the responsibility of every employer to maintain conditions within the work place environment that will not endanger the health, safety or welfare of employees. All facilities, equipment, practices, methods, operations and procedures shall be reasonably adequate to protect employees' health, safety and welfare.

[Order 76-15, § 296-126-094, filed 5/17/76.]

**WAC 296-126-096 Lifting.** Where weights in excess of 20 pounds are to be lifted, carried, pushed or pulled as a normal part of an employee's responsibility:

(1) The lifting, carrying, pushing or pulling duties shall be made known to the prospective employee at the time of recruitment, initial employment or reassignment to a lifting job.

(2) Instruction shall be given such employees on proper lifting techniques in accordance with instructions provided or approved by the department of labor and industries.

(3) Assurance that adequate instructions in weight lifting techniques have been given as provided in (2) shall be furnished the committee or its authorized agent upon request.

[Order 76-15, § 296-126-096, filed 5/17/76.]

**WAC 296-126-098 Wearing apparel.** (1) The employer shall provide for adequate safekeeping of employees' clothing worn to and from the work place, but not worn on duty.

(2) Whenever an employer requires the employees to wear a uniform or other article of wearing apparel of a specific style or color, it must be furnished by the employer. Usual and customary wearing apparel in conformance to a general dress standard need not be furnished by the employer.

[Order 76-15, § 296-126-098, filed 5/17/76.]

**WAC 296-126-130 Variance.** (1) Upon written application from an employer, a variance from any standard herein may be granted by the industrial welfare committee for good cause shown as authorized by section 8, chapter 16, Laws of 1973 2nd ex. sess. The employer shall give notice to the employees or their representative so that they may submit their written views to the committee on any variance request.

[Title 296 WAC—p 1812]

(2) The committee may afford the applicant and any involved employee, or their representatives, the opportunity for oral presentation whenever circumstances of the particular application warrant such additional procedure.

(3) Temporary variance valid for not more than thirty calendar days may be issued by the committee for good cause where immediate action is necessary and warranted pending further review by the committee.

(4) "Good cause" shall mean, but not be limited to, those situations in which the employer finds that his circumstance warrants an alternative procedure and where he is able to demonstrate to the committee that such alternative would not have a harmful effect on the health, safety and welfare of the employees involved.

[Order 74-9, § 296-126-130, filed 3/13/74, effective 4/15/74.]

**WAC 296-126-140 Appeal procedures.** (1) Any person, firm, or corporation feeling aggrieved by any action taken or decision made by an officer or employee of the department, in enforcement of this law (chapter 49.12 RCW) or these standards may appeal such action or decision by filing written notice within thirty days of such action or decision with the committee's secretary, in care of the Department of Labor and Industries, General Administration Building, Olympia, Washington 98504. A copy of said appeal shall be sent to all other parties to the proceeding by the appealing party. A certification as to the service of said notice upon all other parties shall be filed in the office of the committee's secretary. The notice of appeal shall suspend such action or decision pending the determination by the committee. Detailed regulations concerning appeal procedures are contained in chapter 296-129 WAC.

(2) The appealing person, firm or corporation may elect an informal appeal by filing a letter within thirty days of the action or decision by the officer or employee of the department, which letter shall set forth a simple, clear and concise statement of the matter appealed from and the reasons for the appeal. This will then be acted upon without the need of any further submitted briefs. The committee will permit any other party concerned with the appeal to submit similarly a short concise letter stating their respective position on the issues raised by the appeal. The committee reserves the right to dispose of these informal appeals without hearing argument. The committee may either determine the same on the merits, or call for further hearings in the matter consistent with the intent of these regulations and the applicable law wherever appropriate.

(3) The committee shall review the record, accept and consider written briefs, formal or informal, and may hear oral arguments where deemed appropriate. The committee decision shall be final and binding upon all parties subject to judicial review pursuant to chapter 34.04 RCW, the Administrative Procedure Act.

(4) The general practice and procedural rules for the committee in WAC 296-010-010, et seq., as now or hereafter amended, shall be applicable unless otherwise provided for by these rules, chapter 296-126 WAC, or by express ruling of the committee.

[Order 74-9, § 296-126-140, filed 3/13/74, effective 4/15/74.]

**WAC 296-126-200 Applicability.** WAC 296-126-200 through 296-126-226 shall apply to persons employed in counselor staff occupations in organized seasonal recreational camps as herein defined.

[Statutory Authority: RCW 49.12.091. 78-03-004 (Order 78-1), § 296-126-200, filed 2/3/78.]

**WAC 296-126-202 Definitions.** (1) "Department" shall mean the department of labor and industries.

(2) "Committee" shall mean the industrial welfare committee of the department of labor and industries.

(3) "Organized camps," as used herein, shall refer to established resident group camps, which are established and maintained for recreation, education, vacation, or religious purposes, for use by organized groups wherein the activities are conducted on a closely supervised basis, and where day-to-day living facilities, including food and lodging, are provided either free-of-charge or by payment of fee.

(4) "Employ" means to engage, suffer, or permit to work.

(5) "Employee" shall mean any person who is employed in a counselor staff occupation in an organized seasonal recreational camp as herein defined.

(6) "Employer" means any person, association, partnership, private or public corporation who employs or exercises control over wages, hours, or working conditions of one or more employees.

(7) "Minor" shall mean any person under eighteen years of age.

(8) "Counselor staff occupations" shall include all work involving duties primarily relating to guidance, instruction, supervision, and care of campers in organized camps, whether such work involves direct charge of, or responsibility for, such activities, or merely assistance to persons in charge; but shall not include preseason training courses. Counselor staff occupations include, but are not limited to: Head counselor, assistant head counselor, specialist counselor or instructor (such as swimming counselor, arts and crafts counselor, etc.), group or division leader, camp parent, teacher, supervising counselor, senior counselor, counselor, general counselor, bunk counselor, assistant counselor, junior counselor, counselor aide, and kitchen helpers working no more than 27 hours in a given work week.

(9) "Resident counselor staff" shall mean staff who receive lodging and meals from the employer.

(10) "Nonresident counselor staff" shall mean staff who do not receive lodging and meals from the employer.

(11) "Counselor I," "Counselor II," and "Counselor III," shall be defined for purposes of this standard as follows: "Counselor I" is one never before employed in any counselor staff occupations; "Counselor II" is one who has had at least one season's employment in a counselor staff occupation; "Counselor III" is one who has had at least three seasons of employment in a counselor staff occupation.

(12) "Season of employment" is defined as a period of not less than six weeks, nor more than 12 weeks in any one calendar year, except that counselors employed less than six weeks in any one season may accumulate their employment experience from year to year to meet the minimum requirements for counselor grade.

[Statutory Authority: RCW 49.12.091. 78-03-004 (Order 78-1), § 296-126-202, filed 2/3/78.]

**WAC 296-126-204 Minimum wage.** Except as otherwise provided by chapter 49.46 RCW:

(1) The minimum wage for kitchen helpers working in excess of 27 hours per week, camp cooks, and all employees other than counselor staff, shall be no less than \$2.00 per hour for employees 18 years of age or older, and no less than \$1.75 for employees under age 18.

(2) Minimum wage rates for counselor staff occupations shall be as follows:

	MINIMUM WEEKLY RATE	
	Nonresident Employee (6-day week)	Resident Employee (6-day week)
COUNSELOR III	\$66.00	\$51.00
COUNSELOR II	45.00	30.00
COUNSELOR I	36.00	21.00

(3) The minimum daily wage rate for resident or nonresident counselor staff shall be prorated from the six-day basis.

(4) Minimum wage provisions shall not apply to resident campers under the age of 18 who are engaged in an in-training program, which provides prepared instructions and supervision by qualified counselor staff, and which requires no more than 24 on-duty hours weekly. Such resident campers shall (a) carry no responsibility for other campers and no bunk responsibility, except as a defined part of the training program and (b) shall not enter such a program unless their parents or guardians sign an authorization, which includes an outline of the program and a description of the duties and responsibilities involved.

[Statutory Authority: RCW 49.12.091. 78-03-004 (Order 78-1), § 296-126-204, filed 2/3/78.]

**WAC 296-126-206 Limitation on number of employees paid in Counselor I and Counselor II rates.** In any week, an employer may pay the Counselor I rate to no more than 30 percent of the total number of employees in counselor staff occupations. Furthermore, the total number of employees paid at the Counselor I and Counselor II rates may not exceed 80 percent of the total staff. In small camps (40 campers or under) where the above percentage limitations may be unworkable, the supervisor of employment standards shall have authority to make reasonable adjustments of these limitations upon a showing that the above limitations will work a hardship.

[Statutory Authority: RCW 49.12.091. 78-03-004 (Order 78-1), § 296-126-206, filed 2/3/78.]

**WAC 296-126-208 Premium pay for resident counselor staff occupations.** At termination of employment, a resident counselor staff member shall be entitled to premium payment of an additional 25 percent of the staff member's weekly rate of pay for each week of employment, unless he or she received 24 hours per week off-duty, 12 hours of which must have been in sequence. The 24 hours off-duty time need not have been accumulated in any one week.

[Statutory Authority: RCW 49.12.091. 78-03-004 (Order 78-1), § 296-126-208, filed 2/3/78.]

**WAC 296-126-210 Board, lodging, and other services.** The minimum wage rates of resident counselor staff shall be subject to no charge by an employer for lodging or meals furnished by the employer or for any other services furnished in connection with camp business within reason.

[Statutory Authority: RCW 49.12.091. 78-03-004 (Order 78-1), § 296-126-210, filed 2/3/78.]

**WAC 296-126-212 Travel expenses.** The employer shall pay the fare or make transportation available for any counselor staff member who is required or permitted to supervise, or assist in supervising, campers in transit.

[Statutory Authority: RCW 49.12.091. 78-03-004 (Order 78-1), § 296-126-212, filed 2/3/78.]

**WAC 296-126-214 Records.** Records showing the names of employees, dates of employment, wages paid, and days worked by them shall be kept by every employer for a period of at least three years and available for inspection by the representatives of the industrial welfare committee of the department of labor and industries at all reasonable times.

[Statutory Authority: RCW 49.12.091. 78-03-004 (Order 78-1), § 296-126-214, filed 2/3/78.]

**WAC 296-126-216 Agreements.** All employees must enter into a written agreement with the camp administration setting forth the remuneration, room and board, special services provided, and the nature of the work assignment as counselors and leaders. Resident camper parental authorizations and employee agreements are to be kept on file for a three-year period.

[Statutory Authority: RCW 49.12.091. 78-03-004 (Order 78-1), § 296-126-216, filed 2/3/78.]

**WAC 296-126-218 Work permits.** No minor shall be employed until the employer has applied for and received a permit to employ minors from the department of labor and industries, and has obtained a parental authorization and proof of age document for each minor employee.

[Statutory Authority: RCW 49.12.091. 78-03-004 (Order 78-1), § 296-126-218, filed 2/3/78.]

**WAC 296-126-220 Minors' occupations.** No minor worker shall be employed in any occupation which the department of labor and industries, through the industrial welfare committee, shall declare to be particularly

hazardous for minors under the age specified in the minor work permit regulation, chapter 296-125 WAC.

[Statutory Authority: RCW 49.12.091. 78-03-004 (Order 78-1), § 296-126-220, filed 2/3/78.]

**WAC 296-126-222 Sanitation and safety.** (1) All places of employment shall be maintained in a sanitary condition in conformity with the requirements for sanitation for camps set by the health services division, department of social and health services and/or the Washington Industrial Safety and Health Act (WISHA).

(2) All places of employment shall be maintained in a safe condition in conformity with the WISHA standards of the department of labor and industries, division of industrial safety and health.

(3) First aid requirements of the WISHA standards of the department of labor and industries shall be met. In addition, the provision of an infirmary with the full-time services of a physician and/or registered nurse is recommended for camps operated by one organized group for more than two weeks.

(4) Transportation shall be available at all times for use in case of an emergency and shall be of a nature to render reasonable comfort to an injured person.

(5) If preemployment physical examinations, including preventive inoculations, recommended by public health authorities are required of employees, such examinations shall not be at the expense of the employee.

(6) No employee shall be required or permitted to lift or carry excessive weights. Where weights in excess of 20 pounds are to be lifted, carried, pushed, or pulled as a normal part of an employee's responsibility:

(i) The lifting, carrying, pushing or pulling duties shall be made known to the prospective employee at the time of recruitment, initial employment or reassignment to a lifting job.

(ii) Instruction shall be given such employees on proper lifting techniques in accordance with instructions provided or approved by the department of labor and industries.

(iii) Assurance that adequate instruction in weight lifting techniques have been given as provided in (ii) shall be furnished the committee or its authorized agent upon request.

(7) Employee assignments to counseling duties shall be in keeping with the employee's maturity, knowledge, and skills. The health and welfare of the employee shall be considered in the determination of adequate counselor staff-camper ratios. Personnel should be selected on the basis of standards currently prescribed in the American Camping Association Resident Camp standards.

[Statutory Authority: RCW 49.12.091. 78-03-004 (Order 78-1), § 296-126-222, filed 2/3/78.]

**WAC 296-126-224 Wearing apparel.** Whenever an employer requires the employees to wear a uniform or other article of wearing apparel of a specific style or color, it must be furnished by the employer. Usual and customary wearing apparel in conformance to a general dress standard need not be furnished by the employer.

[Statutory Authority: RCW 49.12.091. 78-03-004 (Order 78-1), § 296-126-224, filed 2/3/78.]

**WAC 296-126-226 Penalties.** The department shall investigate the complaint of any individual alleging that these standards have been violated. Any employer employing any person in violation of these standards shall upon conviction thereof be punished in accordance with RCW 49.12.170, which states as follows: "Any employer employing any person for whom a minimum wage or standards, conditions, and hours of labor have been specified, at less than said minimum wage, or under standards, or conditions of labor or at hours of labor prohibited by the rules and regulations of the committee; or violating any other of the provisions of this 1973 amendatory act, shall be deemed guilty of a misdemeanor, and shall, upon conviction thereof, be punished by a fine of not less than twenty-five dollars nor more than one thousand dollars."

[Statutory Authority: RCW 49.12.091. 78-03-004 (Order 78-1), § 296-126-226, filed 2/3/78.]

**Chapter 296-127 WAC  
PREVAILING WAGE**

**WAC**

- 296-127-010 Definitions for chapter 296-127 WAC.
- 296-127-011 Time for determining prevailing wage.
- 296-127-013 Scope of work definitions.
- 296-127-014 Usual benefits.
- 296-127-015 Applicability of prevailing wages for supervisors.
- 296-127-016 Coverage and exemptions of workers involved in the production and delivery of materials predominantly used in road construction.
- 296-127-017 Notice of wage determinations.
- 296-127-019 Survey methodology.
- 296-127-020 Interpretation of phrases used in chapter 39.12 RCW.
- 296-127-021 Apprentice worker.
- 296-127-022 Overtime according to chapter 49.28 RCW.
- 296-127-023 Building service maintenance.
- 296-127-025 Applicability of joint federal-state standards.
- 296-127-026 Exemptions for sole owners and their spouses, partnerships, corporations, and employees of public agencies.
- 296-127-030 Irrigation district exemption.
- 296-127-040 Statement of intent to pay prevailing wages.
- 296-127-045 Affidavit of wages paid.
- 296-127-060 Director of department of labor and industries to arbitrate disputes—General provisions.
- 296-127-061 Requests for arbitration.
- 296-127-062 Conduct of arbitration hearing.
- 296-127-130 Filing of complaint.
- 296-127-140 Investigation of complaint.
- 296-127-150 Notice of violation.
- 296-127-160 Appeal of notice of violation.
- 296-127-170 Hearing on notice of violation.
- 296-127-180 Effect of final decision finding a violation of RCW 39.12.065.
- 296-127-190 Filing of lien against retainage or bonds.
- 296-127-200 Surety bond payable to director.
- 296-127-210 Suit against retainage and bonds.
- 296-127-220 Distribution of recovery.
- 296-127-300 Filing and service.
- 296-127-310 List of violators.
- 296-127-320 Payroll records.

**WAC 296-127-010 Definitions for chapter 296-127 WAC.** (1) "Department" means the department of labor and industries.

(2) "Director" means the director of the department or his or her duly authorized deputy or representative.

(3) "Industrial statistician" means the industrial statistician of the department's employment standards, apprenticeship, and crime victims division.

(4) "Assistant director" means the assistant director of the employment standards, apprenticeship, and crime victims (ESAC) division or his or her duly authorized deputy or representative.

(5) "Contractor" includes subcontractor.

(6) The term "public work" shall include all construction, alteration, enlargement, improvement, repair, and demolition to which any agency of the state of Washington or any agency of a county, city, town, or any other political subdivision, or a public district, is a party, whether such work is executed by contract, purchase order, or any other legal agreement, provided the contracting agency owns the asset which is constructed, altered, enlarged, improved, repaired, or demolished. The public entity which is the source of the funding shall have no bearing on the term public work.

Public work shall also include facilities of new construction which are caused by state agencies to be built by a private party through a contract to rent, lease, or purchase at least eighty percent of such facility for occupation by a state agency as required by chapter 43.19 RCW.

Public work shall also include maintenance, except ordinary maintenance, when performed by contract. For the purpose of this section, maintenance is defined as keeping existing facilities in good usable condition, without repairing damages or breaks. The term contract shall mean a contract in writing for the execution of public work for a fixed or determinable amount duly awarded after advertisement and competitive bid. However, a contract which is awarded from a small works roster need not be advertised.

(7) "Residential construction" means construction, alteration, repair, improvement, or maintenance of single family dwellings, duplexes, apartments, condominiums, and other residential structures not to exceed four stories in height, including basement, when used solely as permanent residences. It does not include the utilities construction (water and sewer lines), or work on streets, or work on other structures (e.g., for recreation and business.)

[Statutory Authority: Chapters 39.04 and 39.12 RCW and RCW 43.22.270. 88-22-046 (Order 88-22), § 296-127-010, filed 10/31/88. Statutory Authority: RCW 39.12.050, 39.12.065, 43.22.270 and 51.04.020. 86-03-063 (Order 85-28), § 296-127-010, filed 1/17/86. Statutory Authority: RCW 39.12.015, 39.12.060 and House Bill 795, 1982 1st ex.s. c 38. 82-18-041 (Order 82-28), § 296-127-010, filed 8/27/82.]

**WAC 296-127-011 Time for determining prevailing wage.** (1) Prevailing wage rates for all contracts will be determined by the department and published only on the first business day of February and the first business day

of August of each year. All prevailing wage rates become effective thirty days after they are published. Awarding agencies must include a schedule of the applicable published prevailing wage rates in the contract documents for each contract. Contractors must include a schedule of the applicable published prevailing wage rates in their contracts with each one of their subcontractors.

(2) For all contracts, except building service maintenance contracts, the prevailing wage rates which are in effect on the date when the bids by the prime contractors are required to be submitted to the contract awarding public agency are the prevailing wage rates which must be paid for the duration of the contract. If the contract is not awarded within six months of this date, the prevailing wage rates which are in effect on the date when the contract is awarded are the prevailing wage rates which must be paid for the duration of the contract.

(3) If an agreement for public works is not awarded pursuant to bids, the prevailing wages which are in effect on the date when the agreement is executed are the prevailing wages which must be paid for the duration of the agreement.

[Statutory Authority: Chapters 39.04 and 39.12 RCW and RCW 43-22.270. 88-22-046 (Order 88-22), § 296-127-011, filed 10/31/88. Statutory Authority: RCW 39.12.015, 39.12.060 and House Bill 795, 1982 1st ex.s. c 38. 82-18-041 (Order 82-28), § 296-127-011, filed 8/27/82.]

**WAC 296-127-013 Scope of work definitions.** In order for the industrial statistician to determine applicable prevailing wage rates, scope of work definitions are needed for each trade and occupation.

(1) The industrial statistician may promulgate scope of work descriptions, using authoritative sources available to the department, such as, but not limited to:

- (a) Washington state apprenticeship and training council approved apprenticeship standards;
- (b) Collective bargaining agreements;
- (c) Dictionary of occupational titles;
- (d) Experts from organized labor, licensed contractors, and contractors' associations.

(2) Scope of work definitions may be revised only on the first business day of February and the first business day of August each year. Scope of work definitions may be obtained from the department on request.

[Statutory Authority: Chapters 39.04 and 39.12 RCW and RCW 43-22.270. 88-22-046 (Order 88-22), § 296-127-013, filed 10/31/88.]

**WAC 296-127-014 Usual benefits.** "Usual benefits" are limited to the following:

(1)(a) Health and welfare payments. This is group medical insurance, which may include dental, vision, and life insurance. (State or federal statutorily mandated insurance programs providing protection against industrial accidents, occupational illnesses, and all related mandatory forms of protection, shall not qualify as health and welfare insurance.)

(b) Pension contributions made into pension plans for which the Internal Revenue Service has issued a letter of acceptance or approval.

(c) Vacation payments made either directly to the employees or into a vacation fund, provided these benefits are paid to the employees.

(d) Apprentice training fund. Payments made to training programs approved or recognized by the Washington state apprenticeship and training council.

(e) Paid holidays. Payments made to employees for specified holidays.

(2) Any fringe benefits required by other local, state, or federal laws do not qualify as "usual benefits."

[Statutory Authority: Chapters 39.04 and 39.12 RCW and RCW 43-22.270. 88-22-046 (Order 88-22), § 296-127-014, filed 10/31/88.]

**WAC 296-127-015 Applicability of prevailing wages for supervisors.** Determinations as to whether individuals are workers, laborers, or mechanics are based on the duties actually performed by the individuals, rather than the title of the occupations.

(1) Supervisors (e.g., foremen, general foremen, superintendents, etc.) are entitled to the prevailing rate of wage if they perform manual or physical labor for more than twenty percent of their hours worked on a public works project during any given week. Supervisors who qualify, are entitled to the journeyman rate of pay for the type of work they performed, for all hours spent performing that manual labor.

(2) If supervisors subject to the journeyman prevailing wage rate are paid a salary, the compensation (salary divided by number of hours worked) must be equal to or greater than the prevailing wage rate for the type of work performed.

[Statutory Authority: Chapters 39.04 and 39.12 RCW and RCW 43-22.270. 88-22-046 (Order 88-22), § 296-127-015, filed 10/31/88.]

**WAC 296-127-016 Coverage and exemptions of workers involved in the production and delivery of materials predominantly used in road construction.** The materials covered under this section are sand, gravel, crushed rock, concrete mix, asphalt, or other similar materials.

(1) For the purpose of this section, a contractor or subcontractor is defined as an employer who has contracted to perform work on a public works project site. Employers who produce and stockpile these materials for public agencies are not considered contractors for the purpose of this section. Workers who are employed by public works contractors or subcontractors are subject to the provisions of chapter 39.12 RCW when:

(a) They are engaged in the production of the above listed materials for a public works project in a sand or gravel pit, rock quarry, concrete mixing plant, or other similar facility; or

(b) They are engaged in the transportation of the above listed materials for use on the public works project, whether or not they perform any work on the project site.

(2) Workers are subject to the provisions of chapter 39.12 RCW, regardless of who their employer is, when:

(a) They deliver any of the above materials to public works construction sites and perform any spreading, leveling, rolling, or otherwise participate in any incorporation of the materials into the project; or



(b) They wait at or near the public works project site to participate in the incorporation of the materials into the project; or

(c) They remove any materials from a public works construction site pursuant to contract requirements or specifications (e.g., excavated materials, materials from demolished structures, cleanup materials, etc.); or

(d) They work in a material production facility (e.g., batch plant, borrow pit, rock quarry, etc.) which is established for a public works project near a public works construction site for the specific, but not exclusive, purpose of supplying materials for the project.

(3) Workers are not subject to the prevailing wage requirements of chapter 39.12 RCW when: They are employed by a common or contract carrier trucking company principally or exclusively engaged in the hauling or delivery of such products, and the employee's duties do not include spreading, leveling, rolling, or otherwise participating in the incorporation of the delivered materials into the project.

[Statutory Authority: Chapters 39.04 and 39.12 RCW and RCW 43-22.270, 88-22-046 (Order 88-22), § 296-127-016, filed 10/31/88.]

**WAC 296-127-017 Notice of wage determinations.** Current prevailing wage data will be furnished by the industrial statistician upon request. Please mail the request to:

Industrial Statistician  
Department of Labor and Industries  
Employment Standards Division  
General Administration Building  
Olympia, Washington 98504 MS AX31r  
(Telephone: (206) 753-4019)

[Statutory Authority: RCW 39.12.015, 39.12.060 and House Bill 795, 1982 1st ex.s. c 38, 82-18-041 (Order 82-28), § 296-127-017, filed 8/27/82.]

**WAC 296-127-019 Survey methodology.** (1) The industrial statistician will use two methods to establish or update prevailing wage rates. They will be:

(a) Data collected by wage surveys; and/or

(b) Wage increases stipulated in collective bargaining agreements for those trades or occupations where a recent wage survey has established that those wage rates prevail.

When wage surveys are conducted, the method will be as follows:

(2) The department will determine the identity of employers to be surveyed for a specific trade or occupation by mailing classification questionnaires to all active licensed or Washington state department of transportation and United States Department of Labor prequalified contractors.

(3) Wage survey forms will then be mailed to:

(a) Those contractors who have indicated on the questionnaire that they employ one or more of the trades being surveyed; and

(b) To union locals representing the trades being surveyed.

(1989 Ed.)

(4) The data from the survey forms will only be used by the department if submitted on behalf of individual contractors identified by contractor registration number.

(5)(a) If the majority of hours worked by any trade or occupation in the largest city in a county is paid at one specific wage rate, that rate is established as the prevailing wage rate.

(b) If no single wage rate is paid to the majority of workers in the same trade or occupation, the average wage rate is established as the prevailing wage rate, based on a weighted average.

(6) Any of the above parties who submit false information under this section, shall, after a determination to that effect has been issued by the director after a hearing under chapter 34.04 RCW, forfeit as a civil penalty the sum of five hundred dollars.

[Statutory Authority: Chapters 39.04 and 39.12 RCW and RCW 43-22.270, 88-22-046 (Order 88-22), § 296-127-019, filed 10/31/88.]

**WAC 296-127-020 Interpretation of phrases used in chapter 39.12 RCW.** (1) The "acceptance date of the public works project" referred to in RCW 39.12.065 is the date the awarding agency accepts the completed public works project.

(2) RCW 39.12.065 and 39.12.050 refer to "inadvertent filing or reporting error." An error is "inadvertent" if it is made notwithstanding the use of due care by the party making the error. The burden of proving that an error is inadvertent is on the person charged with the error.

(3) The definition of "locality" in RCW 39.12.010(2) contains the phrase "wherein the physical work is being performed." The department interprets this phrase to mean the actual work site. For example, if materials are prefabricated in a county other than the county wherein the public works project is to be completed, the wage for the prefabrication shall be the prevailing wage for the county where the physical work of prefabrication is actually performed. Standard items for sale on the general market are not subject to the requirements of chapter 39.12 RCW.

[Statutory Authority: RCW 39.12.050, 39.12.065, 43.22.270 and 51-.04.020, 86-03-063 (Order 85-28), § 296-127-020, filed 1/17/86. Statutory Authority: RCW 39.12.015, 39.12.060 and House Bill 795, 1982 1st ex.s. c 38, 82-18-041 (Order 82-28), § 296-127-020, filed 8/27/82.]

**WAC 296-127-021 Apprentice worker.** Any apprentice employed on public works projects for whom an apprentice agreement is registered and approved by the state apprenticeship council pursuant to chapter 49.04 RCW within 60 days of hiring may be considered an apprentice and paid the applicable prevailing hourly rate for an apprentice of that trade for all hours worked.

[Statutory Authority: RCW 39.12.015, 39.12.060 and House Bill 795, 1982 1st ex.s. c 38, 82-18-041 (Order 82-28), § 296-127-021, filed 8/27/82.]

**WAC 296-127-022 Overtime according to chapter 49.28 RCW.** (1) Work performed on public works contracts will not require the payment of overtime rates for the first two hours worked in excess of eight hours per

[Title 296 WAC—p. 1817]



day when the employer has obtained the employee's agreement to work a four-day, ten-hour work week.

(2) For the purpose of this section an agreement must:

(a) Have been authorized by employees who bargained collectively with their employers through representatives of their own choosing; or

(b) Be obtained in writing; and

(c) Be obtained individually from each employee; and

(d) Obtained separately for each public works project; and

(e) Obtained voluntarily.

(3) It is prohibited to work more than ten hours in any calendar day on a public works project except in cases of extraordinary emergency, such as danger to life or property.

(4) Notwithstanding the above provisions, overtime must be paid for all hours worked in excess of forty hours per week.

[Statutory Authority: RCW 43.22.270, 88-19-055 (Order 88-21), § 296-127-022, filed 9/15/88.]

**WAC 296-127-023 Building service maintenance.** The "public building service maintenance contracts" referred to in RCW 39.12.020 shall mean janitorial service contracts and cover only work performed by janitors, waxers, shampooers, and window cleaners.

For all building service maintenance contracts, the prevailing wage rates which are in effect on the date when the bids are required to be submitted to the contract awarding public agency are the minimum prevailing wage rates which must be paid for the first year of such contracts and thereafter. However, any building service maintenance contract of more than one year duration, must include wage increase language recognizing the potential for future variance in applicable prevailing wage(s) and specifying that the wages which a contractor shall pay its employees must be altered annually to recognize and follow the most recently promulgated increases in prevailing wages each year after the first year of the contract period. The cost of the increases in the wages due employees shall be borne by the contract awarding agency.

[Statutory Authority: Chapters 39.04 and 39.12 RCW and RCW 43-22.270, 88-22-046 (Order 88-22), § 296-127-023, filed 10/31/88.]

**WAC 296-127-025 Applicability of joint federal-state standards.** When a public works project is subject to the provisions of the Washington state public works law, chapter 39.12 RCW, and the Federal Davis-Bacon and related acts, the contractor and every subcontractor on that project must pay at least the Washington state prevailing wage rates, if they are higher than the federal prevailing wage rates for the project.

[Statutory Authority: Chapters 39.04 and 39.12 RCW and RCW 43-22.270, 88-22-046 (Order 88-22), § 296-127-025, filed 10/31/88.]

**WAC 296-127-026 Exemptions for sole owners and their spouses, partnerships, corporations, and employees of public agencies.** The prevailing wage requirements of chapter 39.12 RCW do not apply to:

(1) Sole owners and their spouses.

(2) Any partner who owns at least thirty percent of a partnership.

(3) The president, vice-president and treasurer of a corporation if each one owns at least thirty percent of the corporation.

(4) Workers regularly employed on monthly or per diem salary by the state or any political subdivision created by its laws.

[Statutory Authority: Chapters 39.04 and 39.12 RCW and RCW 43-22.270, 88-22-046 (Order 88-22), § 296-127-026, filed 10/31/88.]

**WAC 296-127-030 Irrigation district exemption.** Contracts awarded by irrigation districts for the reclamation or development of waste or undeveloped lands are not covered by the prevailing wage law, pursuant to RCW 39.04.010. Any work, construction alteration, repair or improvement that is not solely for the reclamation or development of waste or undeveloped land is covered by the prevailing wage laws and therefore subject to all the laws and regulations contained in and adopted pursuant to chapter 39.12 RCW.

[Statutory Authority: RCW 39.12.015, 39.12.060 and House Bill 795, 1982 1st ex.s. c 38, 82-18-041 (Order 82-28), § 296-127-030, filed 8/27/82.]

**WAC 296-127-040 Statement of intent to pay prevailing wages.** (1) All statements of intent to pay prevailing wages for contracts in excess of two thousand five hundred dollars submitted to the industrial statistician of the department shall be accompanied by a fee of twenty-five dollars for each statement. All statements of intent to pay prevailing wages for contracts of two thousand five hundred dollars or less submitted to the department shall be accompanied by a fee of twelve dollars fifty cents for each statement. Fees shall be made payable to the department of labor and industries.

(2) Any agency, division, or department of the state of Washington which through agreement with the department certifies statements of intent for its own contracts shall provide to the industrial statistician each month the number of statements of intent certified and quarterly shall send a fee of ten dollars for each statement of intent to pay prevailing wages it has certified. This fee shall be sent to the industrial statistician and be made payable to the department of labor and industries.

[Statutory Authority: Chapters 39.04 and 39.12 RCW and RCW 43-22.270, 88-22-046 (Order 88-22), § 296-127-040, filed 10/31/88. Statutory Authority: RCW 39.12.015, 39.12.060 and House Bill 795, 1982 1st ex.s. c 38, 82-18-041 (Order 82-28), § 296-127-040, filed 8/27/82.]

**WAC 296-127-045 Affidavit of wages paid.** (1) All affidavits of wages paid for contracts in excess of two thousand five hundred dollars submitted to the industrial statistician of the department shall be accompanied by a fee of twenty-five dollars for each affidavit of wages paid. All affidavits of wages paid for contracts of two thousand five hundred dollars or less submitted to the industrial statistician of the department shall be accompanied by a fee of twelve dollars fifty cents for each affidavit. All fees shall be made payable to the department of labor and industries.

(2) Any agency, division, or department of the state of Washington which through agreement with the department certifies affidavits of wages paid for its own contracts shall provide to the industrial statistician each month the number of affidavit of wages paid it has certified and quarterly shall send a fee of ten dollars for each affidavit of wages paid it has certified. This fee shall be sent to the industrial statistician and be made payable to the department of labor and industries.

[Statutory Authority: Chapters 39.04 and 39.12 RCW and RCW 43-22.270. 88-22-046 (Order 88-22), § 296-127-045, filed 10/31/88. Statutory Authority: RCW 39.12.015, 39.12.060 and House Bill 795, 1982 1st ex.s. c 38. 82-18-041 (Order 82-28), § 296-127-045, filed 8/27/82.]

**WAC 296-127-060 Director of department of labor and industries to arbitrate disputes—General provisions.**

(1) The contract executed between a public authority and the successful bidder or contractor and all of his subcontractors shall contain a provision that in case any dispute arises as to what are the prevailing rates of wages for a specific trade, craft or occupation and such dispute cannot be adjusted by the parties in interest, including labor and management representatives, the matter shall be referred for arbitration to the director, and his decision shall be final, conclusive, and binding on all parties involved in the dispute.

(2) In exercising his authority to hear and decide disputes the director shall consider among other things, timeliness, the nature of the relief sought, matters of undue hardship or injustice, or public interest. A "timely" request for arbitration is one received within 30 days after the contract has been awarded.

(3) Any party in interest who is seeking a modification or other change in a wage determination under RCW 39.12.015, and who has requested the industrial statistician to make such modification or other change and the request has been denied, after appropriate reconsideration by the assistant director shall have a right to petition for arbitration of the determination.

(a) For purpose of this section, the term "party in interest" is considered to include, without limitation:

(i) Any contractor, or an association representing a contractor, who is likely to seek or to work under a contract containing a particular wage determination, or any worker, laborer or mechanic, or any council of unions or any labor organization which represents a laborer or mechanic who is likely to be employed or to seek employment under a contract containing a particular wage determination, and

(ii) Any public agency concerned with the administration of a proposed contract or a contract containing a particular wage determination issued pursuant to chapter 39.12 RCW.

(b) For good cause shown, the director may permit any party in interest to intervene or otherwise participate in any proceeding held by the director. A petition to intervene or otherwise participate shall be in writing, and shall state with precision and particularity:

(i) The petitioner's relationship to the matters involved in the proceedings, and

(ii) The nature of the presentation which he would make. Copies of the petition shall be served on all parties or interested persons known to be participating in the proceeding, who may respond to the petition. Appropriate service shall be made of any response.

[Statutory Authority: RCW 39.12.015, 39.12.060 and House Bill 795, 1982 1st ex.s. c 38. 82-18-041 (Order 82-28), § 296-127-060, filed 8/27/82.]

**WAC 296-127-061 Requests for arbitration.** (1) The petition for arbitration (original and four copies) shall be filed with Director, Department of Labor and Industries, General Administration Building, Olympia, Washington 98504. In addition, copies of the petition shall be served personally or by mail upon each of the following:

(a) The public agency or agencies involved,

(b) The industrial statistician, and

(c) Any other person (or the authorized representatives of such person) known to be interested in the subject matter of the petition.

(2) The director shall under no circumstances request any administering agency to postpone any contract performance because of the filing of a petition. This is a matter which must be resolved directly with the administering agency by the petitioner or other party in interest.

(3) A petition for arbitration of a wage determination shall:

(a) Be in writing and signed by the petitioner or his counsel (or other authorized representative), and

(b) Identify clearly the wage determination, location of project or projects in question, and the agency concerned, and

(c) State that the petitioner has requested reconsideration of the wage determination in question and describe briefly the action taken in response to the request, and

(d) Contain a short and plain statement of the grounds for review, and

(e) Be accompanied by supporting data, views, or arguments, and

(f) Be accompanied by a filing fee of \$75.00. Fees shall be made payable to the department of labor and industries.

[Statutory Authority: RCW 39.12.015, 39.12.060 and House Bill 795, 1982 1st ex.s. c 38. 82-18-041 (Order 82-28), § 296-127-061, filed 8/27/82.]

**WAC 296-127-062 Conduct of arbitration hearing.**

(1) Interested persons other than the petitioner shall have a reasonable opportunity as specified by the director in particular cases to submit to the director written data, views, or arguments relating to the petition. Such material (original and four copies) shall be filed with the Director, Department of Labor and Industries, General Administration Building, Olympia, Washington 98504 and be accompanied by a filing fee of \$35.00. Fees shall be made payable to the department of labor and industries. Copies of any such material shall be served on the petitioner and other interested persons.

(2) Each party in interest shall have the right to appear in person or by or with counsel or other qualified representatives in any proceeding before the director. If all parties agree, oral testimony may be waived and arguments submitted in writing.

(3) Upon his own initiative or upon motion of any interested person or party, the director may consolidate in any proceeding or concurrently consider two or more appeals which involve substantially the same persons or parties, or issues which are the same or closely related, if he finds that such consolidation or concurrent review will contribute to an efficient review and to the ends of justice, and it will not unduly delay consideration of any such appeals.

(4) The director shall prescribe the time and place for hearing. The director shall schedule the hearing within 45 days of the request. For good cause shown, the director may allow a continuance at the request of a party in interest.

(a) With respect to any proceeding before him, the director may upon his own initiative or upon the request of any interested person or party direct the interested persons or parties to appear before the director at a specified time and place in order to simplify the issues presented or to take up any other matters which may tend to expedite or otherwise facilitate the disposition of the proceeding.

(b) All papers submitted to the director under this section shall be filed with the Department of Labor and Industries, General Administration Building, Olympia, Washington 98504. An original and four copies of all papers shall be submitted. Service under this part shall be by the filing party or interested person; service may be personal or may be by mail. Service by mail is complete on mailing.

(5) The final disposition shall be by the director.

(a) The director may decline review of any case whenever in his judgment a review would be inappropriate or because of the lack of timeliness, the nature of the relief sought, or other reasons.

(b) The director shall decide the case upon the basis of all relevant matter contained in the entire record before him but the director may utilize his experience, technical competence, and specialized knowledge in evaluating the evidence.

(c) Upon reasonable notice to the parties or interested persons, the director may vary the procedures specified in this part in particular cases.

(6) The director may allow all parties a period of ten days for filing post-hearing briefs prior to closing the record and concluding the hearing.

(7) The director shall issue a written decision within 30 days of the conclusion of the hearing. A copy shall be sent to each party in interest.

[Statutory Authority: RCW 39.12.015, 39.12.060 and House Bill 795, 1982 1st ex.s. c 38, 82-18-041 (Order 82-28), § 296-127-062, filed 8/27/82.]

**WAC 296-127-130 Filing of complaint.** Any interested party, as defined in RCW 39.12.010(4) may file with the department a complaint alleging a violation of

the prevailing wage laws. The complaint must describe the alleged violation and identify the alleged violator. It would aid the department's investigation if the complaint also specifies:

(1) The name and address of the complainant;

(2) The address of the alleged violator;

(3) The name and address of the public agency that awarded the contract;

(4) The date the public agency accepted the completed public work (if applicable);

(5) The specific rates of wages paid by the violator and the rates that allegedly should be paid;

(6) The exact amount of prevailing wages that are alleged to remain unpaid; and

(7) The date the bids were due on the public works project.

[Statutory Authority: RCW 39.12.050, 39.12.065, 43.22.270 and 51.04.020, 86-03-063 (Order 85-28), § 296-127-130, filed 1/17/86.]

**WAC 296-127-140 Investigation of complaint.** (1) The department shall investigate a complaint filed by an interested party unless the complaint was filed more than thirty days after the date the public agency accepted the public work that gave rise to the complaint. The department may, in its sole discretion, investigate a complaint filed more than thirty days after the acceptance date. However, the department may not charge a contractor with a violation of RCW 39.12.065 if the complaint is filed after the thirty-day limit.

The department's investigation shall determine whether a violation of RCW 39.12.065 or 39.12.050, or both, or of any other provision of chapter 39.12 RCW, occurred.

(2) If the department's investigation substantiates a complaint that alleges that a contractor has violated RCW 39.12.065, the department is required to attempt to collect unpaid wages for the contractor's employees. During the investigation, the department should be able to identify the affected employees. The department shall direct to the affected employees the best notice practicable under the circumstances, including individual notice to all employees who can be identified through reasonable effort. The notice shall inform the employee that (a) the department's final order, whether favorable or not, will apply to all employees; (b) any employee may, if he or she desires, move to intervene as a party in any hearing held as a result of the investigation; and (c) that the employee may have a private right of action to collect unpaid prevailing wages.

[Statutory Authority: RCW 39.12.050, 39.12.065, 43.22.270 and 51.04.020, 86-03-063 (Order 85-28), § 296-127-140, filed 1/17/86.]

**WAC 296-127-150 Notice of violation.** (1) If the department determines after its investigation that there is reasonable cause to believe that the prevailing wage law has been violated, the department shall notify the violator of its determination. The notice of violation shall be served on the violator personally or by certified mail.

(2) The notice of violation shall:

(a) Describe concisely the violation;

(b) Specify which statute or statutes were violated;

(c) If known, identify the laborers, workers, and mechanics who are affected by the violation;

(d) If known, state the amount of unpaid prevailing wages the violator owes;

(e) State that an employee cannot by contract or agreement waive the right to receive the prevailing wage;

(f) State the penalty that the department will assess for a violation, if any, of RCW 39.12.065 and 39.12.050; and

(g) State the date the complaint was filed with the department.

(3) RCW 39.12.065 and 39.12.050 establish the penalty amounts.

(4) If the notice alleges a violation of RCW 39.12.065, the department shall serve a copy of the notice of violation on the violator's sureties under chapters 39.08, 18.27, 19.28, and 60.28 RCW.

(5) The notice of violation shall inform the violator and, if a violation of RCW 39.12.065 is alleged, its sureties that they may request a hearing on the violations, the amount of unpaid prevailing wages owed, or the penalties assessed. The notice shall specify that if no hearing is requested within thirty days of the date of issuance of the notice the director shall issue a final, unappealable order finding that the violation did occur, ordering the violator to pay any unpaid prevailing wages, and assessing penalties.

[Statutory Authority: RCW 39.12.050, 39.12.065, 43.22.270 and 51.04.020. 86-03-063 (Order 85-28), § 296-127-150, filed 1/17/86.]

#### **WAC 296-127-160 Appeal of notice of violation.**

The violator or any of its sureties who are interested in the matter may request a hearing on a notice of violation. One original and four copies of the request must be filed with the director within thirty days after the date the department issued the notice. The party requesting the hearing must also serve a copy of the notice on all interested sureties and, if the requestor is a surety, on the violator.

The request for hearing must be in writing and must specify:

(1) The name and address of the party requesting the hearing;

(2) The notice of violation that is being appealed;

(3) The items of the notice of violation that the requestor believes are erroneous; and

(4) The reasons the notice of violation is erroneous.

[Statutory Authority: RCW 39.12.050, 39.12.065, 43.22.270 and 51.04.020. 86-03-063 (Order 85-28), § 296-127-160, filed 1/17/86.]

#### **WAC 296-127-170 Hearing on notice of violation.**

(1) The director may hear the appeal personally or may delegate the authority to hold the hearing and draft a proposed decision to an administrative law judge pursuant to chapter 34.12 RCW. The plaintiff in the hearing shall be the department, and the defendants shall be the violator and its interested sureties. The department shall have the burden of proving, by a preponderance of the evidence, that the violations occurred and that any wages were unpaid as stated in the notice.

(2) Any interested party may upon motion, be allowed to intervene as a plaintiff in the hearing. "Standing" shall be construed broadly to effectuate the remedial purposes of the prevailing wage law. An interested party, whether or not admitted as a plaintiff, may submit written arguments and affidavits. The parties shall be given an opportunity to respond to or rebut any arguments and affidavits before the person presiding over the hearing makes his or her decision.

(3) The hearing shall be conducted in accordance with the Uniform procedure rules, chapter 1-08 WAC.

(4) If the director presides over the hearing, the director shall issue a final decision that includes findings of fact and conclusions of law, and if appropriate an order to pay unpaid prevailing wages, a penalty, or both.

(5) If an administrative law judge presides over the hearing, she or he shall issue a proposed decision that includes findings of fact, conclusions of law, and if appropriate an order to pay unpaid prevailing wages, a penalty, or both. The proposed decision shall be served by certified mail or personally on the violator, the interested sureties, the department, and any interested parties who have intervened as plaintiffs. Any of these parties, if aggrieved by the proposed decision, may appeal to the director within thirty days after the date of issuance of the proposed decision. If none of the parties appeals within thirty days, the proposed decision may not be appealed either to the director or the courts.

(6) An appellant must file with the director an original and four copies of its notice of appeal. The notice of appeal must specify which findings and conclusions are erroneous. The appellant must attach to the notice the written arguments supporting its appeal.

The appellant must serve a copy of the notice of appeal and the arguments on the other parties. The respondent parties must file with the director their written arguments within thirty days after the date the notice of appeal and the arguments were served upon them.

(7) The director shall review the proposed decision in accordance with the Administrative Procedure Act, chapter 34.04 RCW. The director may: Allow the parties to present oral arguments as well as the written arguments; require the parties to specify the portions of the record on which the parties rely; require the parties to submit additional information by affidavit or certificate; remand the matter to the administrative law judge for further proceedings; and require a departmental employee to prepare a summary of the record for the director to review. The director shall issue a final decision that can affirm, modify, or reverse the proposed decision.

(8) The director shall serve the final decision on all parties. Any aggrieved party may appeal the final decision to superior court pursuant to RCW 34.04.130 unless the final decision affirms an unappealed proposed decision. If no party appeals within the period set by RCW 34.04.130, the director's decision is conclusive and binding on all parties.

[Statutory Authority: RCW 39.12.050, 39.12.065, 43.22.270 and 51.04.020. 86-03-063 (Order 85-28), § 296-127-170, filed 1/17/86.]

**WAC 296-127-180 Effect of final decision finding a violation of RCW 39.12.065.** If the director issues a final decision that includes a finding that a contractor violated RCW 39.12.065 and that the contractor owes unpaid prevailing wages, and the finding is not timely appealed or is affirmed by the courts, the findings and the decision are res judicata in any action by the department or by any interested party who was a plaintiff at the hearing, against the contractor and its sureties to recover the unpaid prevailing wages. The findings and decision are not res judicata in any action by an interested party who was not a plaintiff at the hearing.

[Statutory Authority: RCW 39.12.050, 39.12.065, 43.22.270 and 51.04.020. 86-03-063 (Order 85-28), § 296-127-180, filed 1/17/86.]

**WAC 296-127-190 Filing of lien against retainage or bonds.** (1) Upon receipt of a timely complaint that a contractor has violated RCW 39.12.065, and that the contractor owes unpaid prevailing wages, the department may file a lien against the retainage or bond obtained by the contractor under RCW 60.28.010.

(2) Upon issuance by the director of a final decision that finds that a contractor has violated RCW 39.12.065 or 39.12.050, and that sets a civil penalty for the violation, the department shall file liens for the penalty amount against the retainage and bonds the contractor obtained under RCW 39.12.065 (2)(c), 39.08.010, and 60.28.010.

[Statutory Authority: RCW 39.12.050, 39.12.065, 43.22.270 and 51.04.020. 86-03-063 (Order 85-28), § 296-127-190, filed 1/17/86.]

**WAC 296-127-200 Surety bond payable to director.** (1) RCW 39.12.065 (2)(c) authorizes the director to require a contractor to obtain a surety bond "running to the director in the amount of the violation found." The intent and wording indicates that the director may require such a bond only after issuing a final decision finding that the contractor has violated RCW 39.12.065.

(2) The director may demand that a violating contractor post the bond when:

(a) The director has issued a final decision that finds that the contractor owes unpaid prevailing wages or a penalty, whether or not the decision has been appealed to the courts; and

(b) The retainage or bonds provided under RCW 60.28.010, 18.27.040, and 19.28.120 are or may be insufficient to pay the amount of prevailing wages or the penalty owed.

(3) A contractor may at any time voluntarily obtain a bond running to the director to guarantee the payment of the prevailing wages and any penalty. The contractor may allow the director to satisfy any claim for unpaid wages or the penalty from this bond instead of from the retainage or bonds obtained under RCW 60.28.010, 18.27.040, 19.28.120, and 39.08.010.

[Statutory Authority: RCW 39.12.050, 39.12.065, 43.22.270 and 51.04.020. 86-03-063 (Order 85-28), § 296-127-200, filed 1/17/86.]

**WAC 296-127-210 Suit against retainage and bonds.** (1) If the director issues a final decision that includes a finding that the contractor has violated RCW

39.12.065 or 39.12.050, and the finding is not timely appealed or is affirmed by the courts, the department may file suit against the appropriate retainage and bonds to recover the amount of unpaid prevailing wages or the civil penalty.

(2) The department may, before issuance of a final decision, file suit against the appropriate retainage and bonds to recover unpaid prevailing wages if the filing of a suit is necessary to preserve the claim. The suit shall be held in abeyance pending the exhaustion of administrative remedies.

[Statutory Authority: RCW 39.12.050, 39.12.065, 43.22.270 and 51.04.020. 86-03-063 (Order 85-28), § 296-127-210, filed 1/17/86.]

**WAC 296-127-220 Distribution of recovery.** (1) Upon making a recovery pursuant to RCW 39.12.065(2) against a contractor's retainage or bonds, the department shall distribute the proceeds and any award of attorneys' fees and costs as follows:

(a) The recovery shall be paid to the employees of the violator who did not receive the correct prevailing wage. The distribution among employees shall be based on the evidence of wage loss produced at the hearing on the violation.

(b) Next shall be paid the costs the department incurred in making the recovery. The department shall pay these costs from the attorney's fees and costs awarded by the courts.

(2) A contractor who is the subject of an investigation or who has received a notice of violation may choose not to contest the matter and may tender to the department the amount of unpaid prevailing wages the department determines is owed. The department, after identifying and notifying the affected employees pursuant to WAC 296-127-140, shall accept the tender if the contractor in writing acknowledges that the department, by accepting the tendered amount, does not absolve the contractor from liability to any employee for unpaid prevailing wages.

(3) If an employee for whom the department has recovered unpaid prevailing wages cannot be found, the department shall retain the wages for the one-year period required by RCW 63.29.150. After the statutory period has lapsed, the department shall pay the wages to the department of revenue in accordance with RCW 63.29.170.

[Statutory Authority: RCW 39.12.050, 39.12.065, 43.22.270 and 51.04.020. 86-03-063 (Order 85-28), § 296-127-220, filed 1/17/86.]

**WAC 296-127-300 Filing and service.** All papers required to be filed with the director under this chapter or chapter 39.12 RCW shall be addressed to Director, Department of Labor and Industries, General Administration Building, Olympia, WA. 98504.

Filing and service shall be made as allowed by WAC 1-08-090 through 1-08-140.

[Statutory Authority: RCW 39.12.050, 39.12.065, 43.22.270 and 51.04.020. 86-03-063 (Order 85-28), § 296-127-300, filed 1/17/86.]

**WAC 296-127-310 List of violators.** The department shall maintain a list of all contractors who are forbidden to bid on a public works project, or to have a bid accepted, pursuant to RCW 39.12.065(3) or 39.12.050. To the extent required by RCW 39.12.065(3) and 39.12.050, the industrial statistician shall refuse to certify any statement of intent to pay the prevailing wage or affidavit of wages paid that he or she determines was submitted by a contractor on the list. Because the department receives a large number of requests for certification, the department shall not be liable to any person or entity for certifying a statement or an affidavit of a contractor on the list.

The industrial statistician shall make the list available upon request.

[Statutory Authority: RCW 39.12.050, 39.12.065, 43.22.270 and 51.04.020. 86-03-063 (Order 85-28), § 296-127-310, filed 1/17/86.]

**WAC 296-127-320 Payroll records.** (1) Each contractor shall keep accurate payroll records, showing the name, address, Social Security number, work classification, straight time and overtime hours worked each day and week, and the actual rate of wages paid, for each laborer, worker, and mechanic employed by the contractor for work done on a public work.

(2) A contractor shall, within ten days after it receives a written request, file a certified copy of the payroll records with the agency that awarded the public works contract and with the department.

(3) A contractor's noncompliance with this section shall constitute a violation of RCW 39.12.050.

[Statutory Authority: RCW 39.12.050, 39.12.065, 43.22.270 and 51.04.020. 86-03-063 (Order 85-28), § 296-127-320, filed 1/17/86.]

## Chapter 296-128 WAC MINIMUM WAGES

### WAC

#### RECORDKEEPING PROVISIONS

296-128-010	Records required.
296-128-011	Special recordkeeping requirements.
296-128-012	Overtime for truck and bus drivers.
296-128-015	Definitions of workday and workweek.
296-128-020	Term for keeping records.
296-128-025	Place for keeping records and availability for inspection.
296-128-030	Petitions for exceptions.
296-128-035	Payment interval.

#### HANDICAPPED WORKERS

296-128-050	Applicability of this regulation.
296-128-055	Definition.
296-128-060	Application for certificate.
296-128-065	Conditions for granting a certificate.
296-128-070	Issuance of certificate.
296-128-075	Terms of certificate.
296-128-080	Renewal of certificate.
296-128-085	Review.
296-128-090	Amendment of this regulation.

#### EMPLOYMENT OF LEARNERS

296-128-100	Authority.
296-128-105	Definitions.
296-128-110	Application for learner certificate.
296-128-115	Procedure for action upon an application.
296-128-120	Conditions governing issuance of learner certificates.

296-128-125	Terms and conditions of employment under learner certificates.
296-128-130	Records to be kept by employers of learners.
296-128-135	Amendment and revocation of learner certificate.
296-128-140	Supplemental regulations.
296-128-145	Reconsideration and review.
296-128-150	Procedure for amendment.

#### STUDENT LEARNERS

296-128-175	Applicability of the regulation.
296-128-180	Definitions.
296-128-185	Application for certificate.
296-128-190	Procedure for action upon application.
296-128-195	Conditions governing issuance of special student learner certificate.
296-128-200	Terms and conditions of special student learner certificate.
296-128-205	Term of special certificate.
296-128-210	Review.
296-128-215	Amendment of this regulation.

#### APPRENTICES

296-128-225	Employment of apprentices at subminimum wages.
296-128-230	Definition of apprentice.
296-128-235	Registration of apprenticeship agreement.
296-128-240	Procedure for issuing certificates authorizing employment of apprentices at subminimum wages.
296-128-245	Terms of special certificate.
296-128-250	Hearing procedure.

#### EMPLOYMENT OF STUDENT WORKERS

296-128-275	Applicability.
296-128-280	Definitions.
296-128-285	Filing applications.
296-128-290	Issuing or denying certificates.
296-128-295	Conditions governing issuance of certificates.
296-128-300	Data required on certificate.
296-128-305	Wage rate.
296-128-310	Records.
296-128-315	Amending and revoking certificates.
296-128-400	Minors.
296-128-500	Purpose.
296-128-510	Executive.
296-128-520	Administrative.
296-128-530	Professional.
296-128-540	Outside salesman.
296-128-550	Regular rate of pay.
296-128-560	Compensating time off in lieu of overtime pay.

#### DISPOSITION OF SECTIONS FORMERLY CODIFIED IN THIS CHAPTER

296-128-410	Counselor staff occupations in organized seasonal recreational camps—Women and minors. [Industrial Welfare Order 11-63, filed 9/13/63; Minimum Wage and Welfare Order 54, filed 3/23/60.] Repealed by Order 77-32, filed 12/30/77. Later promulgation, see chapter 296-125 WAC.
296-128-415	Food processing industry—Women and minors. [Industrial Welfare Order 5-62, filed 11/25/64; Minimum Wage and Welfare Order 51, filed 3/23/60.] Repealed by Order 77-32, filed 12/30/77. Later promulgation, see chapter 296-125 WAC.
296-128-420	Fresh fruit and vegetable packing industry—Women and minors. [Industrial Welfare Order 6-62, filed 11/25/64; Minimum Wage and Welfare Order 52, filed 3/23/60.] Repealed by Order 77-32, filed 12/30/77. Later promulgation, see chapter 296-125 WAC.
296-128-425	General amusement and recreation industry—Women and minors. [Industrial Welfare Order 8-62, filed 11/25/64; Minimum Wage Order 45-A, filed 3/23/60.] Repealed by Order 77-32, filed 12/30/77. Later promulgated, see chapter 296-125 WAC.
296-128-430	Health care industry—Women and minors. [Industrial Welfare Order 68-3, filed 5/8/68, effective 7/15/68; Industrial Welfare Order 10-62, filed 11/25/64; Minimum Wage Order 46, filed 3/23/60.]



- Repealed by Order 77-32, filed 12/30/77. Later promulgation, see chapter 296-125 WAC.
- 296-128-435 Laundry, dry-cleaning and dye works industry—Women and minors. [Industrial Welfare Order 3-62, filed 11/25/64; Minimum Wage and Welfare Order 48, filed 3/23/60.] Repealed by Order 77-32, filed 12/30/77. Later promulgation, see chapter 296-125 WAC.
- 296-128-440 Manufacturing industry and general working conditions—Women and minors. [Industrial Welfare Order 2-62, filed 11/25/64; Minimum Wage and Welfare Order 50, filed 3/23/60.] Repealed by Order 77-32, filed 12/30/77. Later promulgation, see chapter 296-125 WAC.
- 296-128-445 Mercantile industry, wholesale and retail—Women and minors. [Order 71-5, § 296-128-445, filed 5/26/71, effective 7/1/71, Mercantile Industrial Welfare Order 1-71; Industrial Welfare Order 1-62, filed 11/25/64; Minimum Wage Order 44, filed 3/23/60.] Repealed by Order 77-32, filed 12/30/77. Later promulgation, see chapter 296-125 WAC.
- 296-128-4451 Applicability. [Order 71-5, § 296-128-4451, filed 5/26/71, effective 7/1/71.] Repealed by Order 77-32, filed 12/30/77. Later promulgation, see chapter 296-125 WAC.
- 296-128-4452 Definitions. [Order 71-5, § 296-128-4452, filed 5/26/71, effective 7/1/71.] Repealed by Order 77-32, filed 12/30/77. Later promulgation, see chapter 296-125 WAC.
- 296-128-4453 Minimum wages. [Order 71-5, § 296-128-4453, filed 5/26/71, effective 7/1/71.] Repealed by Order 77-32, filed 12/30/77. Later promulgation, see chapter 296-125 WAC.
- 296-128-4454 Deductions. [Order 71-5, § 296-128-4454, filed 5/26/71, effective 7/1/71.] Repealed by Order 77-32, filed 12/30/77. Later promulgation, see chapter 296-125 WAC.
- 296-128-4455 Statements furnished. [Order 71-5, § 296-128-4455, filed 5/26/71, effective 7/1/71.] Repealed by Order 77-32, filed 12/30/77. Later promulgation, see chapter 296-125 WAC.
- 296-128-4456 Records. [Order 71-5, § 296-128-4456, filed 5/26/71, effective 7/1/71.] Repealed by Order 77-32, filed 12/30/77. Later promulgation, see chapter 296-125 WAC.
- 296-128-4457 Meal and rest periods. [Order 71-5, § 296-128-4457, filed 5/26/71, effective 7/1/71.] Repealed by Order 77-32, filed 12/30/77. Later promulgation, see chapter 296-125 WAC.
- 296-128-4458 Working conditions. [Order 71-5, § 296-128-4458, filed 5/26/71, effective 7/1/71.] Repealed by Order 77-32, filed 12/30/77. Later promulgation, see chapter 296-125 WAC.
- 296-128-4459 Uniforms. [Order 71-5, § 296-128-4459, filed 5/26/71, effective 7/1/71.] Repealed by Order 77-32, filed 12/30/77. Later promulgation, see chapter 296-125 WAC.
- 296-128-446 Minor work permits. [Order 71-5, § 296-128-446, filed 5/26/71, effective 7/1/71.] Repealed by Order 77-32, filed 12/30/77. Later promulgation, see chapter 296-125 WAC.
- 296-128-4461 Posting of order. [Order 71-5, § 296-128-4461, filed 5/26/71, effective 7/1/71.] Repealed by Order 77-32, filed 12/30/77. Later promulgation, see chapter 296-125 WAC.
- 296-128-4462 Separability. [Order 71-5, § 296-128-4462, filed 5/26/71, effective 7/1/71.] Repealed by Order 77-32, filed 12/30/77. Later promulgation, see chapter 296-125 WAC.
- 296-128-4463 Penalties. [Order 71-5, § 296-128-4463, filed 5/26/71, effective 7/1/71.] Repealed by Order 77-32, filed 12/30/77. Later promulgation, see chapter 296-125 WAC.
- 296-128-450 Office workers—Women and minors. [Industrial Welfare Order 13-63, filed 11/25/64; Minimum Wage Order 43, filed 3/23/60; Statement of interpretation of applicability of Industrial Welfare Committee Order 13-63, office workers, filed 11/25/64.] Repealed by Order 77-32, filed 12/30/77. Later promulgation, see chapter 296-125 WAC.
- 296-128-455 Personal service industry—Women and minors. [Industrial Welfare Order 4-62, filed 11/25/64.] Repealed by Order 77-32, filed 12/30/77. Later promulgation, see chapter 296-125 WAC.
- 296-128-460 Public housekeeping industrial—Women and minors. [Order 71-5 (Industrial Welfare Order No. 9-71), § 296-128-460, filed 5/26/71, effective 7/1/71; Industrial Welfare Order 9-62, filed 11/25/64; Minimum Wage Order 46, filed 3/23/60.] Repealed by Order 77-32, filed 12/30/77. Later promulgation, see chapter 296-125 WAC.
- 296-128-4601 Applicability. [Order 71-5, § 296-128-4601, filed 5/26/71, effective 7/1/71.] Repealed by Order 77-32, filed 12/30/77. Later promulgation, see chapter 296-125 WAC.
- 296-128-4602 Definitions. [Order 71-5, § 296-128-4602, filed 5/26/71, effective 7/1/71.] Repealed by Order 77-32, filed 12/30/77. Later promulgation, see chapter 296-125 WAC.
- 296-128-4603 Minimum wages. [Order 71-5, § 296-128-4603, filed 5/26/71, effective 7/1/71.] Repealed by Order 77-32, filed 12/30/77. Later promulgation, see chapter 296-125 WAC.
- 296-128-4604 Deductions. [Order 71-5, § 296-128-4604, filed 5/26/71, effective 7/1/71.] Repealed by Order 77-32, filed 12/30/77. Later promulgation, see chapter 296-125 WAC.
- 296-128-4605 Statements furnished. [Order 71-5, § 296-128-4605, filed 5/26/71, effective 7/1/71.] Repealed by Order 77-32, filed 12/30/77. Later promulgation, see chapter 296-125 WAC.
- 296-128-4606 Records. [Order 71-5, § 296-128-4606, filed 5/26/71, effective 7/1/71.] Repealed by Order 77-32, filed 12/30/77. Later promulgation, see chapter 296-125 WAC.
- 296-128-4607 Meals and lodging. [Order 71-5, § 296-128-4607, filed 5/26/71, effective 7/1/71.] Repealed by Order 77-32, filed 12/30/77. Later promulgation, see chapter 296-125 WAC.
- 296-128-4608 Meal and rest periods. [Order 71-5, § 296-128-4608, filed 5/26/71, effective 7/1/71.] Repealed by Order 77-32, filed 12/30/77. Later promulgation, see chapter 296-125 WAC.
- 296-128-4609 Working conditions. [Order 71-5, § 296-128-4609, filed 5/26/71, effective 7/1/71.] Repealed by Order 77-32, filed 12/30/77. Later promulgation, see chapter 296-125 WAC.
- 296-128-461 Uniforms. [Order 71-5, § 296-128-461, filed 5/26/71, effective 7/1/71.] Repealed by Order 77-32, filed 12/30/77. Later promulgation, see chapter 296-125 WAC.
- 296-128-4611 Minor work permits. [Order 71-5, § 296-128-4611, filed 5/26/71, effective 7/1/71.] Repealed by Order 77-32, filed 12/30/77. Later promulgation, see chapter 296-125 WAC.
- 296-128-4612 Posting of order. [Order 71-5, § 296-128-4612, filed 5/26/71, effective 7/1/71.] Repealed by Order 77-32, filed 12/30/77. Later promulgation, see chapter 296-125 WAC.
- 296-128-4613 Separability. [Order 71-5, § 296-128-4613, filed 5/26/71, effective 7/1/71.] Repealed by Order 77-32, filed 12/30/77. Later promulgation, see chapter 296-125 WAC.
- 296-128-4614 Penalties. [Order 71-5, § 296-128-4614, filed 5/26/71, effective 7/1/71.] Repealed by Order 77-32, filed 12/30/77. Later promulgation, see chapter 296-125 WAC.
- 296-128-465 Telephone and telegraph industry—Women and minors. [Industrial Welfare Order 12-63, filed 11/25/64; Minimum Wage and Welfare Order 53, filed 3/23/60.] Repealed by Order 77-32, filed



12/30/77. Later promulgation, see chapter 296-125 WAC.  
 296-128-470 Theatrical amusement and recreation industry—  
 Women and minors. [Industrial Welfare Order 7-62,  
 filed 11/25/64; Minimum Wage Order 45, filed  
 3/23/60.] Repealed by Order 77-32, filed 12/30/77.  
 Later promulgation, see chapter 296-125 WAC.

## RECORDKEEPING PROVISIONS

**WAC 296-128-010 Records required.** For all employees who are subject to RCW 49.46.020, employers shall be required to keep and preserve payroll or other records containing the following information and data with respect to each and every employee to whom said section of said act applies:

(1) Name in full, and on the same record, the employee's identifying symbol or number if such is used in place of name on any time, work, or payroll records. This shall be the same name as that used for Social Security record purposes;

(2) Home address;

(3) Occupation in which employed;

(4) Date of birth if under 18;

(5) Time of day and day of week on which the employee's workweek begins. If the employee is part of a workforce or employed in or by an establishment all of whose workers have a workweek beginning at the same time on the same day, a single notation of the time of the day and beginning day of the workweek for the whole workforce or establishment will suffice. If, however, any employee or group of employees has a workweek beginning and ending at a different time, a separate notation shall then be kept for that employee or group of employees;

(6) Hours worked each workday and total hours worked each workweek (for purposes of this section, a "workday" shall be any consecutive 24 hours);

(7) Total daily or weekly straight-time earnings or wages; that is, the total earnings or wages due for hours worked during the workday or workweek, including all earnings or wages due during any overtime worked, but exclusive of overtime excess compensation;

(8) Total overtime excess compensation for the workweek; that is, the excess compensation for overtime worked which amount is over and above all straight-time earnings or wages also earned during overtime worked;

(9) Total additions to or deductions from wages paid each pay period. Every employer making additions to or deductions from wages shall also maintain a record of the dates, amounts, and nature of the items which make up the total additions and deductions;

(10) Total wages paid each pay period;

(11) Date of payment and the pay period covered by payment;

(12) Employer may use symbols where names or figures are called for so long as such symbols are uniform and defined.

[Regulation 294.7.001 (part), filed 12/30/60.]

(1989 Ed.)

**WAC 296-128-011 Special recordkeeping requirements.** (1) In addition to the records required by WAC 296-128-010, employers who employ individuals as truck or bus drivers subject to the provisions of the Federal Motor Carrier Act shall maintain records indicating the base rate of pay, the overtime rate of pay, the hours worked by each employee for each type of work, and the formulas and projected work hours used to substantiate any deviation from payment on an hourly basis pursuant to WAC 296-128-012. The records shall indicate the period of time for which the base rate of pay and the overtime rate of pay are in effect.

For the purposes of this section and WAC 296-128-012, "base rate of pay" means the amount of compensation paid per hour or per unit of work in a workweek of forty hours or less. A base rate of pay shall be established in advance of the work performed and may be based on hours or work units such as mileage, performance of specified duties, or a specified percentage of the gross proceeds charged for specified work. A base rate of pay shall not be established that will result in compensation at less than the minimum wage prescribed in RCW 49.46.020. "Overtime rate of pay" means the amount of compensation paid for hours worked within the state of Washington in excess of forty hours per week and shall be at least one and one-half times the base rate of pay.

(2) The records required by this section shall be made available by the employer at the request of the department. Any current or past employee may obtain copies of the formula, the base rate of pay, the overtime rate of pay, and that employee's records. Job applicants seeking employment by the employer as truck or bus drivers subject to the provisions of the Federal Motor Carrier Act, may obtain copies of the formula, the base rate of pay, and the overtime rate of pay.

[Statutory Authority: RCW 43.22.270, 49.46.130 and 1989 c 104. 89-22-120, § 296-128-011, filed 11/1/89, effective 12/2/89.]

**WAC 296-128-012 Overtime for truck and bus drivers.** (1)(a) The compensation system under which a truck or bus driver subject to the provisions of the Federal Motor Carrier Act is paid shall include overtime pay at least reasonably equivalent to that required by RCW 49.46.130 for working within the state of Washington in excess of forty hours a week. To meet this requirement, an employer may, with notice to a truck or bus driver subject to the provisions of the Federal Motor Carrier Act, establish a rate of pay that is not on an hourly basis and that includes in the rate of pay compensation for overtime. An employer shall substantiate any deviation from payment on an hourly basis to the satisfaction of the department by using the following formula or an alternative formula that, at a minimum, compensates hours worked within the state of Washington in excess of forty hours per week at an overtime rate of pay and distributes the projected overtime pay over the average number of hours projected to be worked. The following formula is recommended for establishing a uniform rate of pay to compensate work

[Title 296 WAC—p 1825]

that is not paid on an hourly basis and for which compensation for overtime is included:

1. Define work unit first. E.g., miles, loading, unloading, other.
2. Average number of work units =  $\frac{\text{Average number of work units accomplished per week}}{\text{Average number of hours projected to be worked per week}}$   
per hour
3. Weekly Base Rate =  $\text{Number of units per hour} \times 40 \text{ hours} \times \text{base rate of pay}$
4. Weekly Overtime rate =  $\text{Number of units per hour} \times \text{number of hours over 40} \times \text{overtime rate of pay}$
5. Total weekly pay =  $\text{Weekly base rate plus weekly overtime rate}$
6. Uniform rate of pay =  $\frac{\text{Total weekly pay}}{\text{Total work units}}$

**Example:** A truck driver is paid on a mileage basis for a two hundred thirty mile trip performed about ten times a week. The base rate of pay is twenty cents a mile. The overtime rate of pay is thirty cents a mile. The average length of the trip is four and one-half hours.

1.  $\frac{2300 \text{ mi.}}{\text{per week}} \div \frac{45 \text{ hours}}{\text{per week}} = \frac{51.1 \text{ miles}}{\text{per hour}}$
2. (a)  $51.1 \text{ miles/hour} \times 40 \text{ hours} \times .20/\text{mile} = \$408.80$   
(b)  $51.1 \text{ miles/hour} \times 5 \text{ hours} = 255.5 \text{ miles}$   
(c)  $255.5 \text{ miles} \times .30/\text{mile} = \$76.65$   
(d)  $\$408.80 \text{ plus } \$76.65 = \$485.45 \text{ divided by } 2300 \text{ miles} = 21.1 \text{ cents mile}$

(b) In using a formula to determine a rate of pay, the average number of hours projected to be worked and the average number of work units accomplished per week shall reflect the actual number of hours worked and work units projected to be accomplished by persons performing the same type of work over a representative time period within the past two years consisting of at least twenty-six consecutive weeks.

(c) The department may evaluate alternative rates of pay and formulas used by employers in order to determine whether the rates of pay established under this section result in the driver receiving compensation reasonably equivalent to one and one-half times the base rate of pay for actual hours worked within the state of Washington in excess of forty hours per week.

(2) Where an employee receives a different base rate of pay depending on the type of work performed, the rate that is paid or used for hours worked within the state of Washington in excess of forty hours per week shall be at least the overtime rate of pay for the type of work in which most hours were worked.

[Statutory Authority: RCW 43.22.270, 49.46.130 and 1989 c 104. 89-22-120, § 296-128-012, filed 11/1/89, effective 12/2/89.]

**WAC 296-128-015 Definitions of workday and workweek.** (1) A workweek is a fixed and regularly recurring period of 168 hours or seven consecutive 24 hour periods. It may begin on any day of the week and any hour of the day, and need not coincide with a calendar week.

[Title 296 WAC—p 1826]

(2) A workday is a fixed and regularly recurring period of 24 hours. It may begin at any hour of a calendar day and must begin at the same time each calendar day.

[Regulation 294.7.001 (part), filed 12/30/60.]

**WAC 296-128-020 Term for keeping records.** Unless otherwise specifically authorized by the director all records required under WAC 296-128-010 shall be kept for a period of at least three years.

[Regulation 294.7.001 (part), filed 12/30/60.]

**WAC 296-128-025 Place for keeping records and availability for inspection.** Each employer shall keep the records required by this regulation safe and accessible at the place or places of employment or at one or more established central recordkeeping offices where such records are customarily maintained. All such records shall be open at any time to inspection and transcription or copying by the director and his duly authorized representative and to the employee, upon request for that employee's work record, at any reasonable time.

[Statutory Authority: RCW 43.22.270, 49.12.020, 49.12.091, 49.12.050, 49.46.020 and 49.46.070. 89-22-016 (Order 89-16), § 296-128-025, filed 10/24/89, effective 11/24/89; Regulation 294.7.001 (part), filed 12/30/60.]

**WAC 296-128-030 Petitions for exceptions.** (1) **Submission of petitions for relief.** Any employer or group of employers who, due to peculiar conditions under which he or they must operate, desires authority to maintain records in a manner other than required in this regulation, or to be relieved of preserving certain records for the period specified in the regulation, may submit a written petition to the director setting forth the authority desired and the reasons therefor.

(2) **Action on petitions.** If, on review of the petition and after completion of any necessary investigation supplementary thereto, the director shall find that the authority prayed for, if granted, will not hamper or interfere with enforcement of the provisions of the act or any regulation or orders issued thereunder, he may then grant such authority but limited by such conditions as he may determine are requisite, and subject to subsequent revocation. Where the authority granted hereunder is sought to be revoked for failure to comply with the conditions determined by the director to be requisite to its existence, the employer or groups of employers involved shall be notified in writing of the facts constituting such failure and afforded an opportunity to achieve or demonstrate compliance.

(3) **Compliance after submission of petitions.** The submission of a petition or the delay of the director in acting upon such petition shall not relieve any employer or group of employers from any obligations to comply with all the requirements of the regulations in this part applicable to him or them. However the director shall give notice of the denial of any petition with due promptness.

[Regulation 294.7.001 (part), filed 12/30/60.]

**WAC 296-128-035 Payment interval.** All wages due shall be paid at no longer than monthly intervals to each

employee on established regular pay days. To facilitate bookkeeping, an employer may implement a regular payroll system in which wages from up to seven days before pay day may be withheld from the pay period covered and included in the next pay period.

[Statutory Authority: RCW 43.22.270, 49.12.020, 49.12.091, 49.12.050, 49.46.020 and 49.46.070. 89-22-016 (Order 89-16), § 296-128-035, filed 10/24/89, effective 11/24/89.]

## HANDICAPPED WORKERS

**WAC 296-128-050 Applicability of this regulation.** This regulation is issued pursuant to RCW 49.46.060, Washington minimum wage and hour law, which authorized the director of the department of labor and industries, to the extent necessary in order to prevent curtailment of opportunities for employment, to issue special certificates for employment of individuals whose earning capacity is impaired by age or physical or mental deficiency or injury at wages lower than the minimum wage applicable under RCW 49.46.020. Such certificates shall be subject to the conditions prescribed in this regulation.

[§ 1, Regulation 294.6.005, filed 12/30/60.]

**WAC 296-128-055 Definition.** "Handicapped worker" means an individual whose earning capacity is impaired by age or physical or mental deficiency or injury for the work he is to perform.

[§ 2, Regulation 294.6.005, filed 12/30/60.]

**WAC 296-128-060 Application for certificate.** (1) Application for a certificate authorizing the employment of handicapped workers shall be made upon forms made available by the director or his authorized representatives.

(2) The application shall set forth, among other things, the nature of the disability, a description of the occupation at which the handicapped worker is to be employed, and the wage the employer proposes to pay the handicapped worker per hour. The nature of the disability must be set out in detail.

(3) The application shall be signed jointly by the employer and the handicapped worker for whom such application is being made, except as otherwise authorized by the director or his authorized representative.

[§ 3, Regulation 294.6.005, filed 12/30/60.]

**WAC 296-128-065 Conditions for granting a certificate.** (1) If the application is in proper form and sets forth facts showing:

(a) A subminimum wage is necessary to prevent curtailment of the handicapped worker's opportunities for employment;

(b) the handicap impairs the earning capacity of the worker for the work he is to perform, a certificate may be issued.

(2) The director or his authorized representative may require the submission of additional information to that

shown on the application and may require the handicapped worker to take a medical examination where it is deemed necessary in order to determine whether or not the issuance of a certificate is justified.

[§ 4, Regulation 294.6.005, filed 12/30/60.]

**WAC 296-128-070 Issuance of certificate.** If the application and other available information indicate that the requirements of this regulation are satisfied, the director or his authorized representative shall issue a certificate. Otherwise he shall deny a certificate. If issued, copies of the certificate shall be mailed to the employer and the handicapped worker and if denied, the employer and the handicapped worker shall be given written notice of the denial.

[§ 5, Regulation 294.6.005, filed 12/30/60.]

**WAC 296-128-075 Terms of certificate.** (1) A certificate shall specify, among other things, the name of the handicapped worker, the name of the employer, the occupation in which the handicapped worker is to be employed, the authorized subminimum wage rate and the period of time during which such wage rate may be paid.

(2) A certificate shall be effective for a period to be designated by the director or his authorized representative and a handicapped worker employed under such certificate may be paid subminimum wages only during the effective period of the certificate.

(3) The wage rate set in the certificate shall be fixed at a figure designed to reflect adequately the handicapped worker's earning capacity. No wage rate shall be fixed at less than 75 percent of the applicable minimum wage under RCW 49.46.020 unless, after investigation a lower rate appears to be clearly justified.

(4) Any money received by a handicapped worker by reason of any state or federal pension or compensation program for handicapped persons shall not be considered as offsetting any part of the wage or remuneration due the handicapped worker by the employer.

(5) The worker or trainee shall be paid not less than one and one-half times the regular rate for hours worked in excess of 40 in the workweek or 8 in the workday.

(6) The terms of any certificate, including the subminimum wage rate specified therein, may be amended by the director or his authorized representative upon written notice to the parties concerned, if the facts justify such amendment.

[§ 6, Regulation 294.6.005, filed 12/30/60.]

**WAC 296-128-080 Renewal of certificate.** Application for renewal of any certificate shall be filed in the same manner as an original application. If such application has been filed prior to the expiration date of the certificate, the certificate shall remain in effect until the application for renewal has been granted or denied.

[§ 7, Regulation 294.6.005, filed 12/30/60.]

**WAC 296-128-085 Review.** Any person aggrieved by any action of the director or his authorized representative taken pursuant to this regulation may, within 15 days after notice of such action has been mailed, file with the director a petition for review of the action complained of, setting forth grounds for seeking such review. If reasonable grounds exist, the director or his authorized representative may grant such review and to the extent deemed appropriate afford all interested persons an opportunity to be heard on such review.

[§ 8, Regulation 294.6.005, filed 12/30/60.]

**WAC 296-128-090 Amendment of this regulation.** Any person desiring revision of any of the terms of this regulation may submit in writing to the director a petition setting forth the changes desired and the reasons for proposing them. If the director believes that reasonable cause for amendment of this regulation is set forth he will schedule a hearing in accordance with RCW 49.46-.080.

[§ 9, Regulation 294.6.005, filed 12/30/60.]

## EMPLOYMENT OF LEARNERS

**WAC 296-128-100 Authority.** This regulation is promulgated in accordance with RCW 49.46.060.

[§ 1, Regulation 294.6.003, filed 3/23/60.]

**WAC 296-128-105 Definitions.** As used in this regulation:

(1) A "learner" is a worker whose total experience is an authorized learner occupation is less than the period of time allowed as a learning period for that occupation in a learner certificate issued pursuant to these regulations.

(2) An "experienced worker" is a worker whose total experience in an authorized learner occupation is at least equal to the period of time allowed as a learning period for that occupation in a learner certificate issued pursuant to these regulations.

(3) "Experienced worker available for employment" means an experienced worker residing within the area from which the employer customarily draws its labor supply or within a reasonable commuting distance of such area, and who is willing and able to accept employment with the employer; or an experienced worker residing outside of the area from which the employer customarily draws its labor supply, who has in fact made himself available for employment.

[§ 2, Regulation 294.6.003, filed 3/23/60.]

**WAC 296-128-110 Application for learner certificate.** (1) Whenever the employment of learners at wages lower than the minimum wage applicable under RCW 49.46.020 is believed necessary to prevent curtailment of opportunities for employment by a specified employer, an application for a certificate authorizing the employment of such learners at subminimum wage rates may

be filed by the employer with the director of the department of labor and industries or his authorized representative.

(2) Application must be made on the official form provided by the department and furnish all information called for on said form.

(3) Separate application must be made with respect to each establishment or place of business operated by the applicant and in which he desires to employ learners at subminimum wage rates.

[§ 3, Regulation 294.6.003, filed 3/23/60.]

**WAC 296-128-115 Procedure for action upon an application.** (1) Upon receipt of an application for a learner certificate or renewal of such certificate the director or his authorized representative shall consider all relevant facts and, subject to the conditions specified in WAC 296-128-120, shall issue or deny a learner certificate or, in appropriate circumstances, provide an opportunity to interested parties to present their views on the application prior to granting or denying a learner certificate.

(2) If a learner certificate is granted, notice of such fact and the terms of the certificate shall be posted at the employer's place of business for 15 days after receipt thereof and any interested person may file with the director written requests for reconsideration or review. Such application should set forth the applicant's interest in the review and the reasons he seeks review.

(3) If a learner certificate is denied, notice of such denial shall be mailed to the employer and it shall be without prejudice to the subsequent filing of an application.

[§ 4, Regulation 294.6.003, filed 3/23/60.]

**WAC 296-128-120 Conditions governing issuance of learner certificates.** The following conditions shall govern the issuance of a special certificate authorizing the employment of learners at subminimum wage rates:

(1) An adequate supply of qualified experienced workers is not available for employment; the experienced workers presently employed in occupations in which learners are requested, are afforded an opportunity for full time employment; learners are available for employment; and the granting of a certificate is necessary to prevent curtailment of employment opportunities.

(2) Reasonable efforts have been made to obtain experienced workers, including the placement of an order with the employment security office of the state of Washington.

(3) The issuance of a learner certificate will not tend to create unfair competitive labor cost advantages nor have the effect of impairing or depressing wage or working standards established for experienced workers for work of a like or comparable character in the industry.

(4) Abnormal labor conditions such as a strike, lock-out or other similar condition do not exist at the place of business for which a learner certificate is requested.

(5) There are no serious outstanding violations of the provisions of learner certificates previously issued to the

employer, nor have there been any serious violations of the Washington Minimum Wage and Hour Act which provide reasonable grounds to believe that the terms of a certificate may not be complied with.

(6) The occupation or occupations in which learners are to receive training require a sufficient degree of skill to necessitate an appreciable training period.

(7) Learners shall be afforded every reasonable opportunity for continued employment upon completion of the learning period.

(8) Unless otherwise specified in the learner certificate, a learning program shall not exceed 480 hours of employment, and the total hours worked in any establishment by learners shall not exceed 10 percent of the total hours normally worked by experienced workers in such establishment: *Provided*, That where less than 10 experienced workers are employed by an employer, a learner certificate may authorize the employment of learners for a maximum of 40 hours per week under a bona fide learner program.

[§ 5, Regulation 294.6.003, filed 3/23/60.]

**WAC 296-128-125 Terms and conditions of employment under learner certificates.** (1) A learner certificate, if issued, shall specify, among other things:

(a) The number or proportion of learners authorized to be employed on any one day;

(b) The occupations in which learners may be employed;

(c) The subminimum wage rates permitted for each learner occupation during the authorized learning period; which shall not be less than 85 percent of the minimum wage specified in RCW 49.46.020, as it may be amended, unless otherwise specified in the certificate;

(d) The learning period for each authorized learner occupation;

(e) The effective and expiration dates of the certificate.

(2) A learner certificate may be issued for a period of not longer than one year. A renewal certificate will not be issued without a clear showing that conditions set forth in WAC 296-128-120 still prevail.

(3) Learners hired pursuant to a learner certificate prior to the date on which such certificate expires may be continued in employment at the authorized subminimum wage rate for the duration of their authorized learning period even though the certificate expired before the learning period is completed.

(4) A copy of the learner certificate shall be posted by the employer during its effective period in a conspicuous place in the department where learners are to be employed.

(5) No learner shall be hired under a learner certificate if, at the time the employment begins, experienced workers capable of equaling the performance of a worker of minimum acceptable skill are available for employment.

(6) No learner shall be hired under a learner certificate while abnormal labor conditions exist such as a strike, lock-out, or other similar conditions in the place

of business for which a learner certificate has been issued.

(7) The number of hours of previous employment in a learner occupation for which the learner has been hired must be deducted from the authorized learning period if within the three years immediately preceding the hiring of such learner he has been employed in the learner occupation for less than the total number of hours authorized as a learning period and shall also be deducted from the authorized learning period all hours spent in pertinent training in a vocational training school on the occupation for which the learner has been employed.

(8) No provision of any learner certificate will excuse noncompliance with higher standards applicable to learners which may be established under any other state law, federal law, or trade union agreement.

(9) Unless otherwise specified in the learner certificate a learning program shall not exceed 480 hours of employment and the total hours worked in any establishment by learners shall not exceed 10 percent of the total hours normally worked by experienced workers in such establishment: *Provided*, That where less than 10 experienced workers are employed by an employer a learner certificate may authorize the employment of learners for a maximum of 40 hours per week under a bona fide learner program.

[§ 6, Regulation 294.6.003, filed 3/23/60.]

**WAC 296-128-130 Records to be kept by employers of learners.** The director or his authorized representative may specify additional records to be kept by employers of learners as a condition to compliance with the learner certificate.

[§ 7, Regulation 294.6.003, filed 3/23/60.]

**WAC 296-128-135 Amendment and revocation of learner certificate.** The director may amend or revoke a learner certificate when it is necessary by reason of changes in these regulations, or where the employer has violated its terms, or where the certificate was obtained by misleading or false statements, or where changed conditions warrant it in the opinion of the director.

[§ 8, Regulation 294.6.003, filed 3/23/60.]

**WAC 296-128-140 Supplemental regulations.** (1) Upon application of any person or persons, representing any industry or branch thereof, or upon his own motion, the director, if he deems it advisable, may, after appropriate and timely notice to interested parties, cause a hearing to be held to determine the need for employment of learners at wages lower than the minimum wage applicable under RCW 49.46.020 in order to prevent curtailment of employment opportunities in any industry or branch thereof; and if such need is found to exist, determine the occupations which require a learning period and the limitations as to wages, time, number, proportion, and length of learning period. Such hearing shall be held before the director or his duly authorized representative. Following such hearing the director may, by supplemental regulations, prescribe the conditions under

which special certificates shall be issued for the employment of learners in such industry or branch thereof, if he finds that there is a need therefor to prevent curtailment of opportunities for employment.

(2) At such hearing the director may cause to be brought before him or his authorized representative any witness whose testimony he deems material to the subject matter before him.

[§ 9, Regulation 294.6.003, filed 3/23/60.]

**WAC 296-128-145 Reconsideration and review.** (1) Any person aggrieved by the action of the director or his authorized representative denying or granting a learner certificate may within 15 days after mailing of notice of such action file a written request for reconsideration with the director.

(2) A request for a reconsideration shall be accompanied by a statement of the additional evidence which the applicant believes may materially affect the decision.

(3) A request for review shall be granted where reasonable grounds are set forth in the request and if such review is granted all interested persons shall be afforded an opportunity to be heard.

[§ 10, Regulation 294.6.003, filed 3/23/60.]

**WAC 296-128-150 Procedure for amendment.** The director may at any time upon his own motion or upon written request of any interested persons setting forth reasonable grounds therefor amend or revoke any of the terms of this regulation or of any supplemental regulations promulgated in accordance with WAC 296-128-140 after hearing as provided in RCW 49.46.080.

[§ 11, Regulation 294.6.003, filed 3/23/60.]

## STUDENT LEARNERS

**WAC 296-128-175 Applicability of the regulation.** This regulation is issued in accordance with RCW 49.46.060, to provide for the employment under special certificates of student learners at wages less than the minimum provided in RCW 49.46.020, in order to prevent curtailment of opportunities for employment. Such certificates shall be subject to the terms and conditions hereinafter set forth.

[§ 1, Regulation 294.6.004, filed 3/23/60.]

**WAC 296-128-180 Definitions.** (1) A "student learner" is a student who is receiving instruction in an accredited school, college, or university, and who is employed on a part-time basis in a bona fide vocational training program, or in a job-training program established by an accredited school and approved by the director of the department of labor and industries.

(2) A "bona fide vocational training program" is one authorized and approved by the state board of vocational education and provides for part-time employment which may be scheduled for part of the workday or workweek, for alternating weeks or for other limited periods during the year, supplemented by and integrated with a definitely organized plan of instruction designed to teach

technical knowledge or related industrial information given as a regular part of the student learner's course by an accredited school, college, or university.

[§ 2, Regulation 294.6.004, filed 3/23/60.]

**WAC 296-128-185 Application for certificate.** (1) Whenever the employment of a student learner at wages lower than the minimum wage applicable under RCW 49.46.020 is believed necessary to prevent curtailment of opportunities for employment, an application for a special certificate authorizing the employment of such student learner at subminimum wages shall be filed by the employer with the director of the department of labor and industries or his authorized representative.

(2) Application shall be on forms furnished by the department of labor and industries and must be signed by the employer, an appropriate school official and the student learner. Such application shall, among other things, show: The nature of the training program; the total number of workers employed by the employer; the number and hourly wage rate of experienced workers employed in the occupation in which the student learner is to be trained; the hourly wage rate or progressive wage schedule which the employer proposes to pay the student learner; the age of the student learner; the period of employment training at subminimum wages; the number of hours of employment training a week; the number of hours of school instruction a week.

[§ 3, Regulation 294.6.004, filed 3/23/60.]

**WAC 296-128-190 Procedure for action upon application.** (1) Upon receipt of application for the employment of a student learner the director or his authorized representative shall either issue a special certificate or deny the application. To the extent deemed necessary the director or his authorized representative may provide an opportunity to interested persons to be heard on the application prior to granting or denying it.

(2) If a special certificate is issued it shall be mailed to the employer and a copy of it shall be mailed to the school official who signs the application.

[§ 4, Regulation 294.6.004, filed 3/23/60.]

**WAC 296-128-195 Conditions governing issuance of special student learner certificate.** The following conditions must be satisfied before a special certificate may be issued authorizing employment of student learners at subminimum wages:

(1) Any training program under which the student learner will be employed must be a bona fide vocational training program as defined in WAC 296-128-180 or be a part of a job-training program established by the governing body of the school and approved by the director of the department of labor and industries.

(2) The employment of the student learner at subminimum wages must be necessary to prevent curtailment of opportunities for employment.

(3) The occupation for which the student learner is receiving preparatory training must require a sufficient



degree of skill to necessitate a substantial learning period.

(4) The employment of a student learner must not have the effect of displacing a worker employed in the establishment in which the student learner is to be employed.

(5) The employment of the student learner at subminimum wages must not tend to impair or depress the wage rates or working standards established for experienced workers for work of a like or comparable nature.

(6) The issuance of such a certificate must not tend to prevent the development of apprenticeships or must not impair established apprenticeship standards in the occupation or industry involved.

[§ 5, Regulation 294.6.004, filed 3/23/60.]

**WAC 296-128-200 Terms and conditions of special student learner certificate.** (1) The special student learner certificate if issued shall specify among other things: (a) The name of the student learner; (b) the name and address of the employer; (c) the name of the school which provides the related school instruction; (d) the occupation in which the student is to be trained; (e) the maximum number of hours of employment training in any one week at a specified subminimum wage rate; (f) the number of hours per week in which the student is engaged in his school training program; (g) the effective and expiration dates of the certificate.

(2) The subminimum wage rate shall be not less than 75 percent of the minimum wage provided in RCW 49.46.020.

(3) Unless otherwise authorized by the director or his authorized representative the number of hours of employment training each week at subminimum wages pursuant to certificate, when added to the hours of school instruction shall not exceed 40 hours: *Provided, however,* That when school is not in session on any school day or school week, the student learner may work a number of hours in addition to the weekly number of hours of employment training authorized by the certificate, provided that the hours do not exceed 8 in such day or 40 in such week.

(4) Unless otherwise authorized by the director or his authorized representative the total number of hours worked by all student learners employed by an employer shall not exceed 10 percent of the total hours worked by all regular employees of said employer in the establishment in which such student learners are employed.

[§ 6, Regulation 294.6.004, filed 3/23/60.]

**WAC 296-128-205 Term of special certificate.** A special student learner certificate may be issued for a period not to exceed the length of one school year unless the director finds that a longer period is justified by extraordinary circumstances.

[§ 7, Regulation 294.6.004, filed 3/23/60.]

**WAC 296-128-210 Review.** Any person aggrieved by the action of the director or his authorized representative in denying or granting a special student learner

certificate may within 15 days after the mailing of notice of such action file a written request for review which will be granted where such request sets forth reasonable grounds therefor. To the extent the director or his authorized representative deems it necessary he shall afford all persons interested in said review an opportunity to be heard.

[§ 8, Regulation 294.6.004, filed 3/23/60.]

**WAC 296-128-215 Amendment of this regulation.** Any person desiring revision of any of the terms of this regulation may submit in writing to the director a petition setting forth the changes desired and the reasons for proposing them. If the director believes that reasonable cause for amendment of this regulation is set forth he will schedule a hearing in accordance with RCW 49.46-.080.

[§ 9, Regulation 294.6.004, filed 3/23/60.]

## APPRENTICES

**WAC 296-128-225 Employment of apprentices at subminimum wages.** The director or his authorized representative, to the extent necessary to prevent curtailment of employment opportunities, shall issue special certificates to employers or apprenticeship committees as defined in RCW 49.04.040 authorizing the employment of apprentices in skilled trades at wages lower than the minimum wage applicable under RCW 49.46.020, subject to the limitations and conditions set forth in this regulation.

[§ 1, Regulation 294.6.002, filed 12/30/60.]

**WAC 296-128-230 Definition of apprentice.** The term "apprentice" shall mean a person at least 16 years of age who is covered by a written agreement registered with the Washington state apprenticeship council providing for not less than 4,000 hours of reasonably continuous employment for such person, and for his participation in an approved schedule of work experience through employment which should be supplemented by 144 hours per year of related technical instruction.

[§ 2, Regulation 294.6.002, filed 12/30/60.]

**WAC 296-128-235 Registration of apprenticeship agreement.** Before an apprentice may be employed at subminimum wages, the employer or apprenticeship committee shall have submitted an apprenticeship agreement for registration with the director of apprenticeship or the apprenticeship council of the department of labor and industries.

[§ 3, Regulation 294.6.002, filed 12/30/60.]

**WAC 296-128-240 Procedure for issuing certificates authorizing employment of apprentices at subminimum wages.** (1) Upon being informed by the director of apprenticeship that such apprenticeship agreement has been accepted for registration in accordance with RCW 49.04.030, and that such agreement calls for employment of apprentices at subminimum wages, the director,



or his authorized representative, may issue a special certificate in accordance with WAC 296-128-225. Otherwise, he shall deny the special certificate.

(2) The special certificate, if issued, shall be mailed to the employer or apprenticeship committee and a copy shall be mailed to the apprentice. If the certificate is denied, the employer or apprenticeship committee will be so notified by mail.

(3) A special certificate will not be issued where there are serious outstanding violations involving an employer for whom a special certificate is being requested, or where there are any serious outstanding violations of a certificate previously issued, or where there have been any serious violations of the act which provide reasonable grounds to conclude that the terms of a certificate may not be complied with, if issued.

[§ 4, Regulation 294.6.002, filed 12/30/60.]

**WAC 296-128-245 Terms of special certificate.** (1) Each special certificate shall specify the conditions and limitations under which it is granted, including the name of the apprentice, the skilled trade in which he is to be employed, the subminimum wage rates and the periods of time during which such wage rates may be paid.

(2) The terms of any special certificate, including the wages specified therein may be amended for cause.

[§ 5, Regulation 294.6.002, filed 12/30/60.]

**WAC 296-128-250 Hearing procedure.** The director or his authorized representative may conduct an investigation, which may include a hearing, prior to issuing or denying an application for special certificate. To the extent he deems appropriate, the director, or his authorized representative, may provide an opportunity for other interested persons to be heard prior to granting or denying an apprentice certificate.

[§ 6, Regulation 294.6.002, filed 12/30/60.]

## EMPLOYMENT OF STUDENT WORKERS

**WAC 296-128-275 Applicability.** The regulations hereinafter set forth are issued pursuant to RCW 49.46-.060 to provide for the employment by educational institutions under special certificates of student workers as learners at wages lower than the minimum wage applicable under RCW 49.46.020. Such certificates shall be subject to the terms and conditions hereinafter set forth.

[§ 1, Regulation 294.6.001, filed 3/23/60.]

**WAC 296-128-280 Definitions.** As used in the regulations:

(1) A "student worker" is a student who is receiving instruction in a bona fide educational program in an educational institution and who is employed on a part-time basis by the educational institution from which the student is receiving his instruction, for the purpose of enabling the student to defray part of his school expenses.

(2) "Department" means department of labor and industries.

(3) "Director" means director of department of labor and industries.

(4) "Supervisor" means supervisor of wage and hour division of the department of labor and industries.

[§ 2, Regulation 294.6.001, filed 3/23/60.]

**WAC 296-128-285 Filing applications.** Whenever the employment of student workers as learners at wages lower than the minimum wage applicable under RCW 49.46.020 is believed necessary to prevent curtailment of opportunities for employment in a specified educational institution, applications for special certificates authorizing the employment of such student workers as learners at subminimum wage rates may be filed by an appropriate official of the educational institution with the director, supervisor, or duly authorized representative of the wage and hour division of the department of labor and industries on official forms furnished by the department.

[§ 3, Regulation 294.6.001, filed 3/23/60.]

**WAC 296-128-290 Issuing or denying certificates.** Upon receipt of an application for the employment of student workers as learners, the director or his authorized representative shall issue or deny a special certificate authorizing employment of student workers. To the extent he deems appropriate, the director or his authorized representative may provide an opportunity to other interested persons to present data and views on the application prior to granting or denying a student worker certificate. If a student worker certificate is granted, it shall be mailed to the educational institution. If a student worker certificate is denied, notice of such denial shall be mailed to the educational institution and such denial shall be without prejudice to the filing of any subsequent application.

[§ 4, Regulation 294.6.001, filed 3/23/60.]

**WAC 296-128-295 Conditions governing issuance of certificates.** The following conditions shall govern the issuance of a special certificate authorizing the employment of student workers as learners by an educational institution at subminimum wage rates:

(1) The employment of the student workers at subminimum wages authorized by the certificate must be necessary to prevent curtailment of opportunities for employment in a specified educational institution.

(2) The issuance of the student worker certificate will not tend to create unfair competitive labor cost advantages nor have the effect of impairing or depressing wage or working standards established for experienced workers for work of a like or comparable character in the industry or community.

(3) The occupations to be filled by the student workers shall not be in the production of goods or services which would be sold in competition with privately owned businesses, nor in enterprises operated by the educational institution in competition with privately owned businesses.

(4) There have been no serious outstanding violations of the provisions of a student workers certificate previously issued to the educational institution, nor have there been any serious violations of the act which provide reasonable grounds to conclude that the terms of a student worker certificate may not be complied with, if issued.

[§ 5, Regulation 294.6.001, filed 3/23/60.]

**WAC 296-128-300 Data required on certificate.** The student worker certificate, if issued, shall specify, among other things:

(1) The name and address of the educational institution employing the student workers;

(2) The occupations in which the student workers are employed;

(3) The number of student workers to be employed in any one day;

(4) The authorized subminimum wage rate to be paid for each occupation;

(5) The effective and expiration dates of the certificate.

[§ 6, Regulation 294.6.001, filed 3/23/60.]

**WAC 296-128-305 Wage rate.** The subminimum wage rate shall be not less than 75 percent of the minimum wage rate established by RCW 49.46.020, as it may be amended.

[§ 7, Regulation 294.6.001, filed 3/23/60.]

**WAC 296-128-310 Records.** In addition to any other records required by reason of the Washington Minimum Wage and Hour Act, the educational institution shall keep and maintain the following records specifically relating to student workers employed at subminimum wage rates:

(1) Each student worker employed under a student worker certificate shall be designated as such on the payroll records kept by the institution, with each student worker's occupation and rate of pay being shown.

(2) The records required including a copy of any special certificate issued, shall be kept and made available for inspection at all times for at least three years from the effective date of the certificate.

[§ 8, Regulation 294.6.001, filed 3/23/60.]

**WAC 296-128-315 Amending and revoking certificates.** The director of the department of labor and industries or his authorized representative may amend the provisions of a student worker certificate or he may revoke such certificate where it is shown to his satisfaction that its provisions have not been complied with.

[§ 9, Regulation 294.6.001, filed 3/23/60.]

**WAC 296-128-400 Minors.** (1) **Applicability of order.** This order shall apply to all minors employed in any industry or establishment in the state of Washington who are not expressly covered by another minimum wage and welfare order issued by the industrial welfare committee, except: Minors employed:

(a) By common carrier railroads, sleeping car companies and freight or express companies subject to regulations of federal law.

(b) In agricultural labor.

(c) In domestic work or chores performed in or about private residences.

(d) In a vocational education, work experience or apprentice training program, when such program is properly supervised by school personnel or in accordance with written agreements and approved training schedules.

(e) Directly by a telephone or telegraph company. This order shall not apply to newspaper vendors and newspaper carriers.

(2) **Definitions.** For the purpose of this order:

(a) A "minor" is a person of either sex under the age of eighteen years.

(b) The term "employee" shall mean any minor who is employed to work in any industry or establishment in the state of Washington other than those expressly excluded by the foregoing paragraphs.

(c) The term "employer" shall mean any person, association, corporation, co-partnership, or municipal corporation, engaged in any industry or establishment covered by this order and who (or which) employs any minor covered by this order.

(d) The term "agricultural labor" shall mean employment.

(i) On a farm, in the employ of any person in connection with the cultivating of the soil, or in connection with raising or harvesting any agricultural or horticultural commodity, including raising, shearing, feeding, caring for, training and management of livestock, bees, poultry, and furbearing animals and wildlife, or in the employ of the owner or tenant or other operator of a farm in connection with the operation, management, conservation, improvement, or maintenance of such farm and its tools and equipment; or

(ii) In handling, planting, packing, packaging, grading, storing, or delivering to storage or to a market or to a carrier for transportation to market, any agricultural or horticultural commodity; but only if such service is performed as an incident to ordinary farming operations, or, in the case of fruits and vegetables in their raw and natural state, as an incident to the preparation of such fruits and vegetables for market. The provisions of this paragraph shall not be deemed to be applicable with respect to services performed in connection with commercial canning or commercial freezing or any other commercial processing which changes the character of the product from its raw and natural state or in connection with any agricultural or horticultural commodity after its delivery to a terminal market for distribution for consumption.

(3) **Minimum wages.**

(a) Minimum wages for all minors covered by this order, in the state of Washington shall be fifty cents per hour, regardless of the manner in which they are computed, except when another order (or orders) issued by the industrial welfare committee of the state of Washington provides a different minimum.

(b) Whenever the administrator of the wage and hour division of the United States department of labor shall issue a certificate or certificates permitting the employment of learners, apprentices, messengers, and handicapped workers, at wage rates below the minimums herein fixed, the payment of wages in accordance with such permits shall not constitute a violation of this order.

**(4) Hours.**

(a) No minor shall be employed more than five hours without a meal period, on the employee's time, of at least thirty minutes.

(b) There shall be a rest period on the employer's time of ten minutes in every four-hour period of employment.

(c) Minors 14 and 15 years of age shall not be employed more than eight hours in any one day or six days in any one week. In computing the hours, one-half the total attendance hours in school shall be included. When school is not in session said minors shall not be employed more than forty hours in any one week.

(d) Minors 16 and 17 years of age shall not be employed more than eight hours in any one day or six days in any one week except in seasonal industries or in cases of emergency.

(e) Minors 14 and 15 years of age shall not be permitted to work after the hours of 7:00 p.m. or before 6 a.m. (pacific standard time), unless such employment is specifically authorized by the terms of this order, or by a permit specifically authorizing such employment issued by the industrial welfare committee of the state department of labor and industries, or its duly designated agent for the issuance of such permit.

(f) Minor boys 14 and 15 years of age may be issued permits to work in approved amusement industries not more than six days a week and not later than 7:00 p.m. (pacific standard time).

(g) Minors 16 and 17 years of age attending school may be employed after 7:00 p.m. (pacific standard time) for such hours not exceeding eight hours in any one day, and in such employments, as shall be specifically authorized in the individual permits issued to each minor, when upon investigation by the supervisor of women and minors in industry the conditions of employment are found not detrimental to the welfare of the minors or their school program. Such permits shall not be issued to girls unless satisfactory assurance is given the industrial welfare committee of the state department of labor and industries or its authorized agent that such minors are to be safely conveyed to their homes.

**(5) Work permits and proof of age certificates.**

(a) No minor shall be employed in any occupation covered by this order unless the employer has on file during the period of employment an unexpired work certificate or permit issued by the industrial welfare committee of the state department of labor and industries or its duly designated agent for the issuance of such permit. Such permit will not be issued except upon presentation of such evidence of age as is required by the industrial welfare committee.

(b) The issuance of a certificate or permit to work shall not authorize or excuse a violation of the state of Washington compulsory school attendance law, and shall

not be issued to any minor legally required to attend school when school is in session except with the approval of the school authorities.

**(6) Employment prohibited to all minors.**

(a) No minor shall be employed in any occupation which the state department of labor and industries, through its industrial welfare committee, shall upon due notice and hearing find and by order declare to be particularly hazardous for the employment of minors under the ages specified in such order as detrimental to their health or morals.

(b) No minor shall be permitted to work in any of the following occupations:

(i) In any place where intoxicating liquor is served in the same room.

(ii) As driver or helper on state licensed motor vehicles in traffic congested areas.

(iii) In operating, tending or in dangerous proximity to dangerous power driven machinery.

(iv) In connection with the commercial operation of a 35 millimeter projection machine in a motion picture theatre or public building.

(v) To give signals to engineers in logging operations, or to receive and forward signals.

(vi) As an engineer, or within dangerous proximity to any cables, rigging or hazardous machinery.

**(7) Employment prohibited to all minor girls.** No minor girl shall be employed as:

(a) A shaker in a laundry, except on hand towels, handkerchiefs, napkins and similar small articles.

(b) In or in connection with a barber shop.

(c) A canvasser or peddler from house to house.

(d) An elevator operator.

(e) A clerk selling cigars or tobacco.

(f) A hotel messenger.

(g) A cabaret performer.

(h) In shooting galleries, penny arcades, bowling alleys.

(i) A public messenger (i.e., one whose services are available to the public for hire), except that girls 16 and 17 years of age will be permitted as building messengers in buildings within a radius of three blocks from one another.

**(8) Employment entirely prohibited to minors under 16 years of age.** Minors under sixteen years of age shall not be permitted to operate machinery in connection with processing or manufacturing plants.

**(9) Employments prohibited to minors under 14 years of age.** Minors under fourteen years of age shall not be employed in the following occupations unless such employment is specifically authorized by a permit issued by a judge of the superior court of the state of Washington:

(a) In stock room work in warehouses.

(b) As clerks in mercantile establishments.

(c) In offices as errand or office maintenance workers.

(d) In cafes as bus boys or dishwashers or helpers.

(e) As service station attendants.

(f) In other occupations which the industrial welfare committee, after due notice and hearing, shall have determined to be hazardous or detrimental to the welfare of the minor.

(10) **Employment of minors 14 to 18 years of age.** Minors 14 to 18 years of age may be employed in any occupation or industry except where such employment is expressly prohibited by this order or by statute of the state of Washington, provided that all the conditions and requirements of this order are complied with.

(11) **Working conditions.**

(a) All places where minors are employed shall be maintained in a safe and sanitary condition. The requirements for safety, sanitation and first aid shall be in conformity with the safety standards, rules and regulations as adopted by the division of safety of the department of labor and industries.

(b) Every room in which minors are employed shall be adequately heated and ventilated, and supplied with adequate natural or artificial light in accordance with the general safety standards of the department of labor and industries.

(c) Each such room shall be provided with a smooth, tight floor, which can be kept clean and sanitary. Where wet processes are employed, the floors must be adequately drained so that there will be no unreasonable depth of liquid at any point. Where floors are wet, wooden racks or grating of an adequate height shall be provided at such points.

(d) Toilet rooms shall be provided for women and female minors sufficiently separated and isolated to insure privacy, which rooms shall be maintained in a sanitary condition, adequately lighted, heated and ventilated. A sufficient number of wash bowls or sink space shall be located either within the toilet room or adjacent to the toilet room. Any wash bowls or sinks not so located shall be installed in an approved location. Sufficient soap and either individual or paper towels shall be provided.

(e) Employers shall provide for adequate keeping of employee's outer clothing during working hours, and for their work clothes during nonworking hours. When the occupation requires a change of clothing, a suitable space adequately heated shall be provided where employees may make such change in privacy.

(f)(i) A suitable rest room for women and female minors shall be provided, and shall be properly ventilated and heated.

(ii) An adequate cloak room shall be provided.

(iii) An adequate lunch room furnished with tables and chairs, and facilities for heating water shall be provided: *Provided, however,* That where less than ten women and female minors are regularly employed, the supervisor of women and minors in industry, upon application and showing, may permit a modified compliance with the foregoing part of this section or any part of the same.

(g) No female minor shall be required or permitted to lift or carry an excessive weight.

(h) No female minor shall be knowingly employed for a period of four weeks before confinement for pregnancy or four weeks thereafter.

(12) **Records.** Records showing the name of minors employed, dates of employment, wages paid and the hours worked by them, shall be kept by the employer and available for inspection by the representatives of the

industrial welfare committee of the state department of labor and industries at all reasonable times.

(13) **Posting of order.** The employer shall post a copy of this order in all places where minor workers are employed.

(14) **Separability.** If the application of any provision of this order, or any section, subsection, subdivision, sentence, clause, phrase, word or portion of this order shall be held invalid or unconstitutional, the remaining provisions thereof shall not be affected thereby but shall continue to be given full force and effect as if the part so held invalid or unconstitutional had not been included therein.

(15) **Penalties.** The supervisor of women and minors in industry shall investigate the complaint of any individual alleging that this order has been violated. Any person employing a minor in violation of this order shall upon conviction thereof be punished in accordance with the applicable laws of the state of Washington, RCW 49.12.170, now states as follows: "Any person employing a woman or minor for whom a minimum wage or standard conditions of labor have been specified, at less than said minimum wage, or under conditions of labor prohibited by order of the committee; or violating any other of the provisions of RCW 49.12.010 through 49.12.180, shall be deemed guilty of a misdemeanor, and shall, upon conviction thereof, be punished by a fine of not less than twenty-five dollars nor more than one hundred dollars."

[Minimum Wage and Welfare Order No. 49, filed 3/23/60.]

**WAC 296-128-500 Purpose.** This regulation is adopted in accordance with chapter 49.46 RCW to define the terms "bona fide executive, administrative, or professional capacity or in the capacity of outside salesman" and to establish a procedure for computing overtime pay.

[Order 76-5, § 296-128-500, filed 2/24/76.]

**WAC 296-128-510 Executive.** The term "individual employed in a bona fide executive . . . capacity" in RCW 49.46.010 (5)(c) shall mean any employee:

(1) Whose primary duty consists of the management of the enterprise in which he is employed or of a customarily recognized department or subdivision thereof; and

(2) Who customarily and regularly directs the work of two or more other employees therein; and

(3) Who has the authority to hire or fire other employees or whose suggestions and recommendations as to the hiring or firing and as to the advancement and promotion or any other change of status of other employees will be given particular weight; and

(4) Who customarily and regularly exercises discretionary powers; and

(5) Who does not devote more than 20 percent, or, in the case of an employee of a retail or service establishment who does not devote as much as 40 percent, of his hours worked in the work week to activities which are not directly and closely related to the performance of the work described in paragraphs (1) through (4) of this

section: *Provided*, That this paragraph (5) shall not apply in the case of an employee who is in sole charge or an independent establishment or a physically separated branch establishment, or who owns at least a 20 percent interest in the enterprise in which he is employed; and

(6) Who is compensated for his services on a salary basis at a rate of not less than \$155 per week exclusive of board, lodging, and other facilities: *Provided*, That an employee who is compensated on a salary rate of not less than \$250 per week (exclusive of board, lodging, or other facilities), and whose primary duty consists of the management of the enterprise in which he is employed or of a customarily recognized department or subdivision thereof, and includes the customary and regular direction of the work of two or more other employees therein, shall be deemed to meet all of the requirements of this section.

[Order 76-5, § 296-128-510, filed 2/24/76.]

**WAC 296-128-520 Administrative.** The term "individual employed in a bona fide . . . administrative . . . capacity" in RCW 49.46.010 (5)(c) shall mean any employee:

(1) Whose primary duty consists of the performance of office or non-manual field work directly related to management policies or general business operations of his employer or his employer's customers; or

(2) The performance of functions in the administration of a school system, or educational establishment or institution, or of a department or subdivision thereof, in work directly related to the academic instruction or training carried on therein; and

(3) Who customarily and regularly exercises discretion and independent judgment; and

(a) Who regularly and directly assists a proprietor, or an employee employed in a bona fide executive or administrative capacity (as such terms are defined in this regulation), or

(b) Who performs under only general supervision work along specialized or technical lines requiring special training, experience or knowledge, or

(c) Who executes under only general supervision special assignments and tasks; and

(4) Who does not devote more than 20 percent, or, in the case of an employee of a retail or service establishment who does not devote as much as 40 percent of his hours worked in the work week to activities which are not directly and closely related to the performance of the work described in paragraphs (1) through (3) of this section; and

(a) Who is compensated for his services on a salary or fee basis at a rate of not less than \$155 per week exclusive of board, lodging, or other facilities; or

(b) Who, in the case of academic administrative personnel is compensated for his services as required by paragraph (4)(a) of this section, or on a salary basis which is at least equal to the entrance salary for teachers in the school system, educational establishment, or institution by which he is employed: *Provided*, That an employee who is compensated on a salary or fee basis at a

rate of not less than \$250 per week (exclusive of board, lodging, or other facilities), and whose primary duty consists of the performance of office or non-manual work directly related to management policies or general business operations of his employer or his employer's customers; which includes work requiring the exercise of discretion and independent judgment, shall be deemed to meet all of the requirements of this section.

[Order 76-5, § 296-128-520, filed 2/24/76.]

**WAC 296-128-530 Professional.** The term "individual employed in a bona fide . . . professional capacity" in RCW 49.46.010 (5)(c) shall mean any employee:

(1) Whose primary duty consists of the performance of work:

(a) Requiring knowledge of an advanced type in a field of science or learning customarily acquired by a prolonged course of specialized intellectual instruction and study, as distinguished from a general academic education and from an apprenticeship, and from training in the performance of routine mental, manual, or physical processes, or

(b) Original and creative in character in a recognized field of artistic endeavor (as opposed to work which can be produced by a person endowed with general manual or intellectual ability and training), and the result of which depends primarily on the intention, imagination, or talent of the employee; or

(c) Teaching, tutoring, instructing, or lecturing in the activity of imparting knowledge and who is employed and engaged in this activity as a teacher in the school system or educational establishment or institution by which he is employed; and

(2) Whose work requires the consistent exercise of discretion and judgment in its performance; and

(3) Whose work is predominantly intellectual and varied in character (as opposed to routine mental, manual, mechanical or physical work) and is of such a character that the output produced or the result accomplished cannot be standardized in relation to a given period of time; and

(4) Who does not devote more than 20 percent of his hours worked in the work week to activities which are not an essential part of and necessarily incident to the work described in paragraphs (1) through (3) of this section; and

(5) Who is compensated for his services on a salary or fee basis at a rate of not less than \$170 per week exclusive of board, lodging, or facilities: *Provided*, That this paragraph (5) shall not apply in the case of an employee who is the holder of a valid license or certificate permitting the practice of law, medicine, or dentistry and who is actually engaged in the practice thereof: *Provided*, That an employee who is compensated on a salary or fee basis at a rate of not less than \$250 per week (exclusive of board, lodging, or other facilities), and whose primary duty consists of the performance of work either requiring knowledge of an advanced type in a field of science or learning, which includes work requiring the consistent

exercise of discretion and judgment, or requiring invention, imagination, or talent in a recognized field of artistic endeavor, shall be deemed to meet all of the requirements of this section.

[Order 76-5, § 296-128-530, filed 2/24/76.]

**WAC 296-128-540 Outside salesman.** The term "individual employed in the capacity of outside salesman" in RCW 49.46.010 (5)(c) shall mean any employee:

(1) Who is employed for the purpose of and who is customarily and regularly engaged away from his employer's place or places of business, as well as on the premises (where the employee regulates his own hours and the employer has no control over the total number of hours worked) in the following alternative activities:

(a) In making sales; including any sale, exchange, contract to sell, consignment for sale, shipment for sale or other disposition; or

(b) In obtaining orders or contracts for services or for the use of facilities for which a consideration will be paid by the client or customer; or

(c) In demonstrating products or equipment for sale; or

(d) In the sale of services and performance of the service sold when the compensation to the employee is computed on a commission basis; and

(2) Whose hours of work of a nature other than that described in (1)(a), (b), (c) and (d) of this section do not exceed 20 percent of the hours worked in the work week by nonexempt employees of the employer: *Provided*, That work performed incidental to and in conjunction with the employee's own outside sales or solicitations, including incidental deliveries and collections, shall not be regarded as nonexempt work; and

(3) Who is compensated by the employer on a guaranteed salary, commission or fee basis and who is advised of his status as "outside salesman."

[Order 76-5, § 296-128-540, filed 2/24/76.]

**WAC 296-128-550 Regular rate of pay.** The regular rate of pay shall be the hourly rate at which the employee is being paid, but may not be less than the established minimum wage rate. Employees who are compensated on a salary, commission, piece rate or percentage basis, rather than an hourly wage rate, unless specifically exempt, are entitled to one and one-half times the regular rate of pay for all hours worked in excess of 40 per week. The overtime may be paid at one and one-half times the piecework rate during the overtime period, or the regular rate of pay may be determined by dividing the amount of compensation received per week by the total number of hours worked during that week. The employee is entitled to one and one-half times the regular rate arrived at for all hours worked in excess of 40 per week.

[Order 76-5, § 296-128-550, filed 2/24/76.]

(1989 Ed.)

**WAC 296-128-560 Compensating time off in lieu of overtime pay.** The provisions of chapter 49.46 RCW requiring one and one-half times the regular rate of pay for hours worked in excess of 40 per week does not apply to any person who requests compensating time off in lieu of overtime pay. Therefore, compensating time may be as agreed upon by the employer and the individual employee at the request of the employee, but may not be imposed by the employer in lieu of overtime pay upon any employee who has not so requested such compensating time off.

[Order 76-5, § 296-128-560, filed 2/24/76.]

## Chapter 296-129 WAC INDUSTRIAL WELFARE COMMITTEE APPEAL PROCEDURES

### WAC

296-129-020	Appeal briefs.
296-129-030	Appeal briefs—Contents.
296-129-040	Record on appeal.

**Reviser's note:** For standards of labor for the protection of the safety, health and welfare of employees for all occupations subject to chapter 49.12 RCW, see also chapter 296-126 WAC.

**WAC 296-129-020 Appeal briefs.** Appeal briefs may be filed in the office of the committee's secretary by the respective parties to the appeal on their own behalf or by someone representing them thirty days following the filing of the notice of appeal. Any party to the appeal filing an appeal brief may request that the hearing of oral arguments upon the appeal be held before the committee. The time, place and date for hearing oral arguments, when granted, shall be scheduled after the expiration of the time for filing briefs and the notice sent to all parties to the appeal where such an oral argument is deemed desirable by the committee.

[Order 74-9, § 296-129-020, filed 3/13/74, effective 4/15/74.]

**WAC 296-129-030 Appeal briefs—Contents.** An appeal brief, if filed, shall consist of the following:

(1) Statement of the case. A brief statement of the nature of the case which is the subject of the appeal and a clear and concise statement of the facts appropriate to an understanding of the nature of the controversy.

(2) Assignments of error. Each error relied upon and served with the notice of appeal shall be clearly pointed out. Whenever error is assigned to any finding of fact or conclusion of the department employee, so much of the finding or conclusion claimed to be erroneous should be set out verbatim in the brief.

(3) Appellant's brief should set forth and discuss the authorities in support of the position of the appellant and shall be designed and arranged to address the assignments of error and the issues arising therefrom.

(4) Respondent's brief should contain argument and discussion in opposition to the assignments of error of the appellant, and/or in support of the decision or rulings of the departmental employee or agent.

[Order 74-9, § 296-129-030, filed 3/13/74, effective 4/15/74.]

[Title 296 WAC—p 1837]



**WAC 296-129-040 Record on appeal.** Upon receipt of a copy of the notice of appeal, whether informal or formal, the departmental employee or agent shall promptly cause to be prepared and forwarded to the office of the secretary of the committee the record on appeal which shall include a transcript of the proceedings of any hearing that may have been held by said employee or agent, the originals of all exhibits or documentary evidence received by the employee during the course of any hearing and any other papers or evidence before the employee relied upon in arriving at the decision. All exhibits shall be appropriately and plainly marked for reference. In addition, the employee shall certify in the appropriately titled case the record on appeal as containing all evidence, matters and things coming before said employee at any hearing relied upon in making his findings, conclusions, decisions and any remedial order. A copy of the record on appeal, or any portion thereof, may be obtained by any party to the appeal on payment to the employee of the reasonable cost per page.

[Order 74-9, § 296-129-040, filed 3/13/74, effective 4/15/74.]

### Chapter 296-130 WAC FAMILY CARE

#### WAC

296-130-010	Declaration of purpose.
296-130-020	Definitions.
296-130-030	Employee rights.
296-130-035	Employee complaints.
296-130-040	Prohibited action.
296-130-050	Posting.
296-130-060	Notices of infraction.
296-130-065	Service on employers.
296-130-070	Appeal of infraction notice.
296-130-080	Penalty assessment.
296-130-500	Collective bargaining not impaired.

**WAC 296-130-010 Declaration of purpose.** It is in the public interest for employers to accommodate employees by providing reasonable leaves from work for family reasons. This chapter serves to establish a minimum standard allowing an employee to use the employee's accrued sick leave to care for a child of the employee.

[Statutory Authority: RCW 43.22.270 and 1988 c 236. 88-18-044 (Order 88-20), § 296-130-010, filed 8/31/88.]

**WAC 296-130-020 Definitions.** (1) "Employer" means any person, firm, corporation, partnership, business trust, legal representative, or other business entity which engages in any business, industry, profession, or activity in this state and employs one or more employees. Employer also includes the state, any state institution, any state agency, political subdivisions of the state, and any municipal corporation or quasi-municipal corporation.

(2) "Employee" means a worker who is employed in the business of an employer. "Employee," for the purposes of this chapter, also includes workers performing in an executive, administrative, professional, or outside sales capacity.

[Title 296 WAC—p 1838]

(3) "Employ" means to engage, suffer, or permit to work.

(4) "Accrued sick leave" means leave which the employee has accumulated by earning a certain number of hours or days per month or per year which the employee is entitled to use to continue his or her normal compensation during absences due to illness, accident, or other conditions which require medical treatment or supervision, and which is provided for by a collective bargaining agreement, employer/employee agreement, employer policy, ordinance, or civil service rule.

It does not include annual leave, vacation leave, or personal leave. It does not include any benefit which includes leave granted by short-term or long-term disability plans except in a case where those plans include a separate and identifiable component which allows the employee to accumulate by earning a certain number of hours or days per month or per year which the employee is entitled to use to continue his or her normal compensation in absence due to illness, accident, or other conditions which require medical treatment or supervision which is provided for by a collective bargaining agreement, employer/employee agreement, employee/employer policy, ordinance, or civil service rule. In a case where a short-term or long-term disability plan includes a separate and identifiable component which allows the employee to accumulate leave by earning a certain number of hours or days per month or per year which the employee is entitled to use to continue his or her normal compensation in absence due to illness, accident, or other conditions which require medical treatment or supervision, only that separate identifiable portion shall be considered accrued sick leave.

(5) "Child of the employee" means any child under the age of eighteen who is:

- The natural offspring of the employee;
- The adopted child of the employee;
- The natural or adopted child of the employee's spouse; or

(d) Is under the employee's legal guardianship, legal custody, or foster care.

(6) "Health condition that requires treatment or supervision" shall include:

- Any medical condition requiring medication that the child cannot self medicate;
- Any medical or mental health condition which would endanger the child's safety or recovery without the presence of a parent or guardian; or

(c) Any condition warranting preventive health care such as physical, dental, optical or immunization services, when a parent must be present to authorize and when sick leave may otherwise be used for the employee's preventive health care.

(7) "Infraction" means an alleged violation of RCW 49.12.\_\_\_\_ (chapter 236, Laws of 1988) as cited by the department.

(8) "Administrative law judge" means any person appointed by the chief administrative law judge, as defined in RCW 34.12.020(2) to preside at contested cases convened under RCW 49.12.\_\_\_\_ (chapter 236, Laws of 1988).



(9) "Department" means the department of labor and industries.

[Statutory Authority: RCW 43.22.270 and 1988 c 236. 88-18-044 (Order 88-20), § 296-130-020, filed 8/31/88.]

**WAC 296-130-030 Employee rights.** An employer shall allow an employee to use the employee's accrued sick leave, when such benefit exists, to care for the child of the employee under the age of eighteen with a health condition that requires treatment or supervision as defined in WAC 296-130-020(6). In all other instances the same benefits and requirements that would govern the employee's personal use of accrued sick leave shall apply to the use of sick leave for the child's treatment or supervision. Nothing in this section requires an employer to provide sick leave.

[Statutory Authority: RCW 43.22.270 and 1988 c 236. 88-18-044 (Order 88-20), § 296-130-030, filed 8/31/88.]

**WAC 296-130-035 Employee complaints.** (1) An employee who believes that his or her employer has not complied with RCW 49.12.\_\_\_\_ (chapter 236, Laws of 1988), or with the rules promulgated thereto, may file a complaint with the department within six months of the alleged violation. The complaint should contain the following:

(a) The name and address of the employee making the complaint;

(b) The name, address, and telephone number of the employer against whom the complaint is made;

(c) A statement of the specific fact which constitute the alleged violation, including the date(s) on which the alleged violation occurred.

(2) Upon receipt of a complaint, the department shall forward written notice of the complaint to the employer, along with a warning of prohibited actions as stated in WAC 296-130-040.

(3) The department may investigate any complaint it deems appropriate. If the department determines that a violation of this chapter has occurred, it may issue a notice of infraction pursuant to WAC 296-130-060.

[Statutory Authority: RCW 43.22.270 and 1988 c 236. 88-23-117 (Order 88-29), § 296-130-035, filed 11/23/88.]

**WAC 296-130-040 Prohibited action.** No employer shall discharge or in any other way discriminate against or penalize any employee because he/she sought any information about family leave provisions, has filed a complaint alleging a violation of the chapter or exercised any right granted under the law. Nothing in this section however, shall prohibit an employer from applying its attendance policies.

[Statutory Authority: RCW 43.22.270 and 1988 c 236. 88-18-044 (Order 88-20), § 296-130-040, filed 8/31/88.]

**WAC 296-130-050 Posting.** (1) The department shall furnish each employer a poster describing an employee's rights and an employer's obligations provided in this chapter.

(2) The employer shall keep posted a current edition department poster stipulating the provisions of this

chapter. The employer shall display this poster in a conspicuous place.

(3) The employer shall post its leave policies, if any, in a conspicuous place accessible to the employees at the employer's place of business.

(4) The posting requirement for employees whose leave policies are specified by individual contracts may be satisfied by stating that leave for such employees will be governed by the terms of such contracts.

(5) Employers with informal leave policies which are established on a case-by-case basis may satisfy the posting requirement by posting a statement explaining that policy.

[Statutory Authority: RCW 43.22.270 and 1988 c 236. 88-18-044 (Order 88-20), § 296-130-050, filed 8/31/88.]

**WAC 296-130-060 Notices of infraction.** The department may issue a notice of infraction to an employer who violates RCW 49.12.\_\_\_\_ (chapter 236, Laws of 1988). The employment standards supervisor shall direct that notices of infraction contain the following when issued.

(1) A statement that the notice represents a determination that the infraction has been committed by the employer named in the notice and that the determination shall be final unless contested;

(2) A statement that the infraction is a noncriminal offense for which imprisonment shall not be imposed as a sanction;

(3) A statement of the specific violation which necessitated issuance of the infraction;

(4) A statement of the penalty involved if the infraction is established;

(5) A statement informing the employer of the right to a hearing conducted pursuant to chapter 34.04 RCW if requested within twenty days of issuance of the infraction;

(6) A statement that at any hearing to contest the notice of infraction the state has the burden of proving, by a preponderance of the evidence, that the infraction was committed, and that the employer may subpoena witnesses including the agent that issued the notice of infraction;

(7) If a notice of infraction is personally served upon a supervisory or managerial employee of a firm or corporation, the department shall within ten days of service send a copy of the notice by certified mail to the employer;

(8) Constructive service may be made by certified mail directed to the employer named in the notice of infraction.

[Statutory Authority: RCW 43.22.270 and 1988 c 236. 88-18-044 (Order 88-20), § 296-130-060, filed 8/31/88.]

**WAC 296-130-065 Service on employers.** (1) If an employer is a corporation or a partnership, the department need not serve the employer personally. In such a case, if no officer or partner of a violating employer is present, the department may issue a notice of infraction to any supervisor or managerial employee.

(2) If the department serves a notice of infraction on a supervisory or managerial employee, and not on an officer, or partner of the employer, the department shall mail by certified mail a copy of the notice of infraction to the employer. The department shall mail a second copy by ordinary mail.

[Statutory Authority: RCW 43.22.270 and 1988 c 236. 88-18-044 (Order 88-20), § 296-130-065, filed 8/31/88.]

**WAC 296-130-070 Appeal of infraction notice.** (1) If an employer desires to contest the notice of infraction issued, the employer shall file two copies of a notice of appeal with the department at the office designated on the notice of infraction, within twenty days of issuance of the infraction.

(2) The department shall conduct a hearing in accordance with chapter 34.04 RCW and chapter 10-08 WAC.

(3) Employers may appear before the administrative law judge through counsel, or may represent themselves. The department shall be represented by the attorney general.

(4) All relevant evidence shall be admissible in a hearing convened pursuant to RCW 49.12.\_\_\_\_ (chapter 236, Laws of 1988). Admission of evidence is subject to RCW 34.04.100 and 34.04.105 of the Administrative Procedure Act of Washington.

(5) The administrative law judge shall issue a proposed decision that includes findings of fact, conclusions of law, and if appropriate, any legal penalty. The proposed decision shall be served by certified mail or personally on the employer and the department. The employer or department may appeal to the director within thirty days after the date of issuance of the proposed decision. If none of the parties appeals within thirty days, the proposed decision may not be appealed either to the director or the courts.

(6) An appellant must file with the director an original and four copies of its notice of appeal. The notice of appeal must specify which findings and conclusions are erroneous. The appellant must attach to the notice the written arguments supporting its appeal.

The appellant must serve a copy of the notice of appeal and the arguments on the other parties. The respondent parties must file with the director their written arguments within thirty days after the date the notice of appeal and the arguments were served upon them.

(7) The director shall review the proposed decision in accordance with the Administrative Procedure Act, chapter 34.04 RCW. The director may: Allow the parties to present oral arguments as well as the written arguments; require the parties to specify the portions of the record on which the parties rely; require the parties to submit additional information by affidavit or certificate; remand the matter to the administrative law judge for further proceedings; and require a departmental employee to prepare a summary of the record for the director to review. The director shall issue a final decision that can affirm, modify, or reverse the proposed decision.

[Title 296 WAC—p 1840]

(8) The director shall serve the final decision on all parties. Any aggrieved party may appeal the final decision to superior court pursuant to RCW 34.04.130 unless the final decision affirms an unappealed proposed decision. If no party appeals within the period set by RCW 34.04.130, the director's decision is conclusive and binding on all parties.

[Statutory Authority: RCW 43.22.270 and 1988 c 236. 88-18-044 (Order 88-20), § 296-130-070, filed 8/31/88.]

**WAC 296-130-080 Penalty assessment.** An employer found to have committed an infraction under RCW 49.12.\_\_\_\_ (chapter 236, Laws of 1988) may be assessed the maximum penalty of a fine of two hundred dollars for the first noncompliance violation. An employer that continues to violate the terms of the statute may be subject to a fine not to exceed one thousand dollars for each violation.

[Statutory Authority: RCW 43.22.270 and 1988 c 236. 88-18-044 (Order 88-20), § 296-130-080, filed 8/31/88.]

**WAC 296-130-500 Collective bargaining not impaired.** Nothing in this chapter shall be deemed to interfere with, impede, or in any way diminish the right of employees to bargain collectively with their employers through representatives of their own choosing in order to establish leave benefits in excess of the applicable minimum under the provisions of this chapter.

[Statutory Authority: RCW 43.22.270 and 1988 c 236. 88-18-044 (Order 88-20), § 296-130-500, filed 8/31/88.]

## Chapter 296-131 WAC

### AGRICULTURAL EMPLOYMENT STANDARDS

#### WAC

296-131-001	Applicability.
296-131-010	Payment interval.
296-131-015	Pay statements.
296-131-017	Employment records.

**WAC 296-131-001 Applicability.** These standards, adopted pursuant to sections 83 through 86, chapter 380, Laws of 1989, shall apply to persons employed in agricultural labor as defined in RCW 50.04.150.

[Statutory Authority: RCW 43.22.270, 1989 c 380 and chapter 49.46 RCW. 89-22-015 (Order 89-15), § 296-131-001, filed 10/24/89, effective 11/24/89.]

**WAC 296-131-010 Payment interval.** All wages due shall be paid at no longer than monthly intervals to each employee on established regular pay days, unless federal law requires more frequent pay intervals. To facilitate bookkeeping, an employer may implement a regular payroll system in which wages from up to seven days before pay day may be withheld from the pay period covered and included in the next pay period.

[Statutory Authority: RCW 43.22.270, 1989 c 380 and chapter 49.46 RCW. 89-22-015 (Order 89-15), § 296-131-010, filed 10/24/89, effective 11/24/89.]

(1989 Ed.)

**WAC 296-131-015 Pay statements.** A pay statement shall be provided to each employee at the time wages are paid. The pay statement shall identify the employee, show the number of hours worked or the number of days worked based on an eight-hour day, the rate or rates of pay, the number of piece work units earned if paid on a piece work basis, the gross pay, the pay period, all deductions and the purpose of each deduction for the respective pay period. A pay statement shall also include the employer's name, address, and telephone number.

[Statutory Authority: RCW 43.22.270, 1989 c 380 and chapter 49.46 RCW. 89-22-015 (Order 89-15), § 296-131-015, filed 10/24/89, effective 11/24/89.]

**WAC 296-131-017 Employment records.** (1) Every employer shall keep for at least three years a record of the name, address, and occupation of each employee, dates of employment, rate or rates of pay, amount paid each pay period to each such employee and the hours worked.

(2) Every employer shall make the records described in subsection (1) of this section available to the director or the director's authorized representative at any time for inspection and transcription or copying and to the employee, upon request for that employee's work record, at any reasonable time.

[Statutory Authority: RCW 43.22.270, 1989 c 380 and chapter 49.46 RCW. 89-22-015 (Order 89-15), § 296-131-017, filed 10/24/89, effective 11/24/89.]

**Chapter 296-133 WAC**

**PROCEDURAL RULES SUPPLEMENTARY TO THE HEALTH CARE ACTIVITIES LABOR RELATIONS ACT, CHAPTER 156, LAWS OF 1972 EX. SESS.**

**WAC**

- 296-133-010 Intent and purpose.
- 296-133-020 Policy.
- 296-133-030 Construction.
- 296-133-040 General.
- 296-133-050 Petitioner.
- 296-133-060 Authorized agent.
- 296-133-070 Employee association or organization—Qualifications.
- 296-133-080 Bargaining representative—Selection of—Petition.
- 296-133-090 Filing of petition.
- 296-133-100 Contents of petition—General.
- 296-133-110 Contents of petition filed by employee or employee organization.
- 296-133-120 Contents of petition filed by employer.
- 296-133-130 Intervention.
- 296-133-140 Conferences—Notice of hearing.
- 296-133-150 Petition—Amendments or withdrawals.
- 296-133-160 Unit determinations—Considerations.
- 296-133-170 Representation questions—Timeliness.
- 296-133-180 Employee lists.
- 296-133-190 Authorization cards—Acceptability.
- 296-133-200 Conduct of election.
- 296-133-210 Run-off election procedure.
- 296-133-220 Certification.
- 296-133-230 Unfair labor practices—Who may file.
- 296-133-240 Filing of charges.
- 296-133-250 Actionable charges—Dismissals.
- 296-133-260 Remedial orders.
- 296-133-270 Extensions of time.

- 296-133-280 Impasse-determination.
- 296-133-290 Administrative appeals to the director.
- 296-133-300 Appeal briefs.
- 296-133-310 Appeal briefs—Contents.
- 296-133-320 Record on appeal.

**WAC 296-133-010 Intent and purpose.** These rules are adopted pursuant to the authority of section 8, chapter 156, Laws of 1972 ex. sess., (hereinafter referred to as the "act") as supplementary to the act for the purpose of providing rules of procedure to aid and assist the department of labor and industries, its authorized agents, and interested parties in proceedings under the act. The department of labor and industries, (hereinafter referred to as "department") and its authorized agents may waive any requirements of these rules, unless a party shows that it would be prejudiced by such waiver or unless the rule to be waived involves a mandatory provision of the act.

[Order 72-13, § 296-133-010, filed 7/31/72.]

**WAC 296-133-020 Policy.** It is the policy of the department to expedite the settlement of labor disputes between health care activities and their employees and to promote peace in labor relations and nothing in these rules should be construed to prevent the department and its authorized agents, where not inconsistent with the intent and purpose of the act, from using its best efforts to adjust through conciliation any labor dispute arising between employers, employees or employee organizations subject to the provisions of the act.

[Order 72-13, § 296-133-020, filed 7/31/72.]

**WAC 296-133-030 Construction.** These rules shall be liberally construed to effectuate the purposes and provisions of the act.

[Order 72-13, § 296-133-030, filed 7/31/72.]

**WAC 296-133-040 General.** Any terms used in these rules that are defined in the act shall have the same meaning as set forth therein.

[Order 72-13, § 296-133-040, filed 7/31/72.]

**WAC 296-133-050 Petitioner.** "Petitioner" shall mean any person, employer or employee association authorized to request the department to take action under the provisions of the act or these rules.

[Order 72-13, § 296-133-050, filed 7/31/72.]

**WAC 296-133-060 Authorized agent.** "Authorized agent" of the department shall mean the director, the supervisor of industrial relations, a labor mediator or a hearing officer specifically authorized by the director to conduct proceedings under the act.

[Order 72-13, § 296-133-060, filed 7/31/72.]

**WAC 296-133-070 Employee association or organization—Qualifications.** In order to qualify as an employee association as referred to in section 3 of the act, any such organization or association:

(1) Upon request by the authorized agent, or any party of interest, must produce authentic records of how, when and by whom the organization was formed.

(2) Shall have a written constitution and/or bylaws which plainly indicates that one of the primary purposes of the organization or association is to represent employees in labor relations matters with employers and is consistent with the requirements of the act and is available for review by any member.

(3) The constitution and/or bylaws must provide:

(a) An approved, customary or recognized method for the nomination and election of officers in accordance with accepted parliamentary procedures, the terms of such officers not to exceed four years.

(b) An approved method of financial record keeping and a financial audit at least once a year, which audit is available to any member for review.

(c) That at least four regular meetings must be held each year with adequate notice of meetings to all members.

(d) That a specific and reasonable minimum number of members or a percentage of the membership must be present to form a quorum before any organization business may be transacted at regular or special meetings.

[Order 72-13, § 296-133-070, filed 7/31/72.]

**WAC 296-133-080 Bargaining representative--Selection of--Petition.** Applications to the department regarding the selection of a bargaining representative to represent employees of a bargaining unit of an employer shall be by petition on such form or forms as may be provided by the department. A written petition may be accepted by the department if the petition contains substantially the same information required by the forms provided by the department.

[Order 72-13, § 296-133-080, filed 7/31/72.]

**WAC 296-133-090 Filing of petition.** The petition for certification, decertification or amendment of certification of the representative of a bargaining unit must be filed either:

(1) With the Supervisor, Division of Industrial Relations, Department of Labor and Industries, General Administration Building, Olympia, Washington 98504; or

(2) If the health care activity is situated in western Washington with the Labor Mediator, Division of Industrial Relations, Department of Labor and Industries, 300 West Harrison Street, Seattle, Washington 98119; or

(3) If the health care activity is situated in eastern Washington with the Labor Mediator, Division of Industrial Relations, Department of Labor and Industries, North 1322 Post Street, Spokane, Washington 99207.

[Order 72-13, § 296-133-090, filed 7/31/72.]

**WAC 296-133-100 Contents of petition--General.** Petitions for the certification, decertification, or amendment of certification of an employee representative of a bargaining unit shall contain the following:

[Title 296 WAC--p 1842]

(1) A statement as to whether the petition is filed by a health care activities employee organization, a health care activities employee or a health care activities employer.

[Order 72-13, § 296-133-100, filed 7/31/72.]

**WAC 296-133-110 Contents of petition filed by employee or employee organization.** Petitions for certification decertification or amendment of certification filed by a health care activities employee organization or a health care activities employees, shall contain:

(1) A description of the bargaining unit which the petitioner claims to be appropriate, a statement as to whether there is any disagreement between the petitioner and interested parties as to the nature and scope of the proposed bargaining unit; and statement that the petitioner is authorized to represent at least thirty percent of the employees within the proposed bargaining unit.

(2) The names and addresses of any persons or employee organizations, known to the petitioner, who claim to represent any employees in the proposed appropriate bargaining unit; the expiration dates and brief descriptions of any collective bargaining agreements which may be in effect between an employer and an employee organization covering all or a portion of the employees in the proposed bargaining unit.

(3) The number and job titles of the employees in the proposed bargaining unit.

(4) A statement that the employer declines to recognize the petitioner as the employee representative, or that the health care activities employer is about to recognize another employee organization as the exclusive bargaining representative or the presently recognized or certified employee organization is no longer the representative of the employees in the proposed bargaining unit.

(5) The name, affiliation, if any, and the address of the petitioner.

(6) Whether a work stoppage or picketing is in progress at the health care activity and, if so, the approximate number of employees participating and the date that such work stoppage or picketing commenced.

(7) Any other relevant factual information.

(8) A specific statement of the relief or remedy that the petitioner seeks the department to invoke.

[Order 72-13, § 296-133-110, filed 7/31/72.]

**WAC 296-133-120 Contents of petition filed by employer.** Petitions for certification or amendment of certification of a bargaining representative filed by a health care activities employer, shall contain:

(1) A factual statement setting forth that one or more individuals or employee organizations has presented to the petitioner a claim to be recognized as the exclusive bargaining representative of all employees in a bargaining unit claimed to be appropriate; the job titles of the employees of such bargaining unit; the number of employees in such unit; and a statement of reasons as to whether the petitioner agrees or disagrees as to the nature or scope of such requested bargaining unit.

(2) The name or names, affiliation, if any, and addresses of individuals or employee organizations known to the petitioner making such claim for recognition as to the exclusive bargaining representative of employees in the health care activity.

(3) A statement regarding whether the petitioner has contracts with any employee organization or other representatives of employees, and if so, the expiration dates of such agreements.

(4) A statement as to whether or not a work stoppage or picketing is in progress at the health care activity involved, and if so, the approximate number of employees participating, and the date such work stoppage or picketing commenced.

(5) A statement of other relevant facts.

(6) A statement regarding the remedy or relief the petitioner requests the department to invoke.

[Order 72-13, § 296-133-120, filed 7/31/72.]

**WAC 296-133-130 Intervention.** Any third party having a legitimate interest in any proceedings commenced under the act may file a petition seeking intervention in such proceedings setting forth facts sufficient to establish such interests and setting forth in such petition the remedy or relief the petitioner seeks the department to invoke.

For the purposes of third party intervention, "legitimate interest" means that the petitioner must allege in the petition for intervention and be prepared to prove if requested that it is authorized to represent at least thirty percent of the employees within a proposed bargaining unit before leave to intervene may be granted. Any employee organization which has a signed, valid collective bargaining agreement encompassing the proposed bargaining unit or any portion thereof shall be considered to have a legitimate interest upon presentation to the department of an executed authentic copy of such collective bargaining agreement.

[Order 72-13, § 296-133-130, filed 7/31/72.]

**WAC 296-133-140 Conferences--Notice of hearing.** Upon the filing of petition for certification, decertification or amendment of certification of an exclusive bargaining representative of employees and the determination of an appropriate bargaining unit, an authorized agent shall confer with and may hold informal conferences with the known interested parties in an effort to ascertain the agreed upon facts of the controversy. The authorized agent shall encourage the parties to agree upon an appropriate bargaining unit within the limitations of the act. Whenever the authorized agent shall determine that the parties are unable to agree upon an appropriate bargaining unit, and is unable to settle the controversy without hearing, a hearing shall be conducted. Notice of such hearing, with the time and place of such hearing, shall be given to all parties by mail at least six days prior to the date of hearing, excluding Saturdays, Sundays and legal holidays. Within a reasonable time following the determination of an appropriate bargaining unit, the authorized agent shall

provide for a bargaining representation election in accordance with the provisions of section 3 of the act and as further provided in these rules.

[Order 72-13, § 296-133-140, filed 7/31/72.]

**WAC 296-133-150 Petition--Amendments or withdrawals.** At any time prior to the issuance of the written notice of a bargaining representation election, a petitioning party may, subject to the discretion of the authorized agent, amend or withdraw his petition.

[Order 72-13, § 296-133-150, filed 7/31/72.]

**WAC 296-133-160 Unit determinations--Considerations.** Whenever the department is called upon to make a determination of an appropriate bargaining unit within a health care activity, within the limitations of the act, the department shall consider the duties, skills and working conditions of the health care activities employees; the history of collective bargaining by the health care activities employees and their bargaining representative within the proposed bargaining unit and in the health care industry; the extent of organization among the health care activities employees; the desires of such employees and the affect of the proposed bargaining unit upon the efficiency of administration of the health care activity.

[Order 72-13, § 296-133-160, filed 7/31/72.]

**WAC 296-133-170 Representation questions--Timeliness.** The department will not consider any question of representation within any bargaining unit or subdivision thereof in any health care activity within which in the preceding twelve-month period a valid election has been held. Nor will the department entertain any petition giving rise to the question of representation within any bargaining unit or portion thereof with a health care activity having a collective bargaining agreement in effect, except during the period not more than ninety nor less than sixty days prior to the expiration date of any such agreement. A collective bargaining agreement which contains a provision for automatic renewal or extension of the agreement or which is effective for a term of more than three years shall not be deemed to be a valid collective bargaining agreement for the purposes of this section.

[Order 72-13, § 296-133-170, filed 7/31/72.]

**WAC 296-133-180 Employee lists.** Health care activities employers shall furnish a current list of the names and addresses of all employees in a proposed or agreed upon bargaining unit prior to any scheduled representation hearing. The lists of such employees shall be available upon request to any organization which has been qualified under these rules and meeting the requirements of section 3 of the act.

[Order 72-13, § 296-133-180, filed 7/31/72.]

**WAC 296-133-190 Authorization cards--Acceptability.** In order to be acceptable as evidence of representation for the purposes of the thirty percent

requirements of section 3 of the act, individual authorization cards must be signed and dated by the employee expressing his intention to be represented by a specific bargaining representative. A card signed and dated six months or more prior to the date on which examination of cards for representation purposes commences shall be considered invalid and not acceptable for representation purposes.

[Order 72-13, § 296-133-190, filed 7/31/72.]

**WAC 296-133-200 Conduct of election.** In the event a representation election is conducted for the purposes of certification, the following rules shall apply:

(1) Notice of election shall be given to all interested parties, and shall be prominently posted by the employer at a place or places within the health care services facility reasonably accessible to all employees. Notices of election shall be sent by mail to all interested parties no less than ten days prior to the date of the election excluding Saturdays, Sundays and legal holidays. Notices of election shall contain the following information; the date of election, hours and place of election, a list of employees eligible to vote, a description of the bargaining unit and a listing of employee organizations from which eligible employees may choose by ballot as well as a choice that such employees do not wish to be represented by any bargaining representative.

(2) Employee shall be deemed eligible to vote in an election for the certification of an exclusive bargaining representative of the employees of an appropriate bargaining unit who are regularly employed within the bargaining unit, either full or part time, and who are in the employ of the employer within fourteen days prior to the date of the issuance of the notice of election and on the date of election, except, supervisors as defined in section 2, subsection 5 of the act, and guards as defined in section 2, subsection 6 of the act, unless the bargaining unit is exclusively devoted to employees serving in the capacity of guards. Employees otherwise eligible to vote in a certification election may be permitted to vote by absentee ballot upon the filing of an affidavit with the authorized agent indicating that such person is eligible to vote in the certification election and that by reason of physical incapacity will be unable to be present at the balloting place on the date of election. The casting of ballots in a representation election by proxy will not be permitted.

(3) Each of the interested parties may designate one person as observer at the polls. Unless otherwise stipulated by the interested parties, observers must be non-supervisory employees of the health care activities employer.

(4) Any observer, or the authorized agent, for good cause may challenge any employee's eligibility to vote. A challenged ballot shall be placed in an envelope bearing no identifying marks. It shall be placed in another envelope upon which shall be written the name of the employee desiring to cast a ballot, the reasons for which the ballot was challenged, by whom it was challenged, the

polling place at which it was challenged, and the envelope shall be sealed and initialed by the authorized agent.

(5) The challenged ballots previously placed in separate envelopes shall be placed in a sealed envelope marked "challenged ballots" and sent along with the tally sheet to the authorized agent. The challenged ballots shall not be opened or counted unless the counting of such ballots might affect the results of the election. If the challenged ballots might affect the results of the election, the authorized agent shall conduct an investigation into and if requested conduct a formal hearing on the validity of the challenges made. If it is concluded that the challenge was properly made, that ballot shall be excluded from the count. Otherwise, such ballot shall be counted as cast.

(6) Ballots may not be tallied until after the time for the closing of the polls unless all eligible voters have cast their ballot.

(7) Within five days after the tally of the ballots has been furnished, any party may file with the authorized agent an original and three copies of objections to the conduct of the election, or conduct affecting the results of the election, which shall contain a short factual statement of the reasons for the objections. Such filing must be timely, whether or not the challenged ballots are sufficient in number to affect the results of the election. Copies of such objections shall immediately be served by mail upon the other parties by the party filing them. If objections are filed to the conduct of the election, or conduct affecting the result of the election, the authorized agent shall investigate such objections. If the objections to the conduct of the election were sustained and the objections would affect the results of the election, the authorized agent, if requested by one of the interested parties, shall conduct a formal hearing.

[Order 72-13, § 296-133-200, filed 7/31/72.]

**WAC 296-133-210 Run-off election procedure.** Where more than one employee organization is on the ballot, and neither of the three or more choices receives votes from a majority of the votes cast in the election, a run-off election shall be held. The run-off ballot shall contain the two choices which receive the largest and second largest number of votes.

[Order 72-13, § 296-133-210, filed 7/31/72.]

**WAC 296-133-220 Certification.** If no timely objections are filed, the authorized agent will certify, as an exclusive bargaining representative, the employee organization which receives votes from a majority of the employees who vote in the election or any run-off election or will certify that no employee organization receive votes from a majority of the employees who voted in the election or any run-off election. A copy of such certification shall be mailed to all interested parties within ten days of certification, along with a certification of the results of the election.

[Order 72-13, § 296-133-220, filed 7/31/72.]



**WAC 296-133-230 Unfair labor practices--Who may file.** Any employee or employee organization or a health care activities employer may file in writing an unfair labor practice charge with the department of labor and industries, alleging an unfair labor practice as set forth in the applicable provisions of sections 4 and 5 of the act: *Provided*, That this section and other sections of these rules relating to unfair labor practice charges, shall not be construed to prohibit an employee, an employee organization or an employer from instituting court proceedings as authorized under section 7 of the act without first having exhausted the remedies provided by these rules, except, in those cases in which an employee, an employee organization or an employer requests the director of labor and industries to exercise the authority invested in him to institute court proceedings to seek relief from the commission of an unfair labor practice. Any decision by a court rendered upon the merits of an unfair labor practice charge pursuant to a legal action instituted under the authority of section 7 shall be deemed *res judicata* and a bar to maintaining proceedings under this section and other sections of these rules relating to unfair labor practice charges.

[Order 72-13, § 296-133-230, filed 7/31/72.]

**WAC 296-133-240 Filing of charges.** Unfair labor practice charges shall be filed on such form or forms provided by the department and shall contain the following:

- (1) The name and address of the health care activities employer.
- (2) The name and address of the person or organization who is filing the charges.
- (3) The statement as to the basis of the charge which shall be specific as to facts, names, addresses, dates and places.
- (4) A statement as to whether or not the complainant has instituted legal proceedings under the authority of section 7 of the act seeking relief from the alleged commission of an unfair labor practice.
- (5) The unfair labor practice charges shall be verified under oath in substantially the following form:

-----, being first sworn on oath, deposes and says: That he is the complainant named in the foregoing unfair labor practice charges, that he has read the unfair labor practice charges, knows the contents thereof and believes the same to be true and correct to the best of his knowledge and belief.

-----  
(Signature of Complainant)

Subscribed and sworn to before me on this  
----- day of ----- 1972.

-----  
Notary Public in and for the  
State of Washington, Residing  
at -----

[Order 72-13, § 296-133-240, filed 7/31/72.]

**WAC 296-133-250 Actionable charges--Dismissals.** Upon receipt of an unfair labor practice charge, the department shall determine whether or not the complainant has alleged actionable charges of unfair labor practices under the provisions of the act. If the department finds that actionable charges have been alleged by the complainant, the department may give notice of not less than three days to the parties to the controversy that an informal hearing conference will be held at which conference testimony and evidence will be taken under oath to determine whether such charges are factually meritorious or frivolous. If the charges are found to be actionable charges and the evidence obtained at the informal hearing conference discloses that the charges are made in good faith and give rise to substantial questions of fact or law, the department shall issue a complaint and schedule the matter for hearing. If the informal hearing conference discloses that the unfair labor practice charges are frivolous and not made in good faith and do not give rise to substantial questions of fact or law, the unfair labor practice charges shall be dismissed and those persons or organizations named in such charges shall be notified in writing of such dismissal and the reasons for the dismissal. If the department finds that actionable charges have not been alleged under the provisions of the act, the unfair labor practice charges shall be dismissed and those persons or organizations named in such charges shall be notified in writing of such dismissal and the reasons for the dismissal.

[Order 72-13, § 296-133-250, filed 7/31/72.]

**WAC 296-133-260 Remedial orders.** Remedial orders may be issued by the department which shall afford an appropriate remedy or relief consistent with the provisions of the act and the findings and conclusions of the authorized agent, which may include the prominent posting of such remedial orders within the health care activity at such place or places reasonably accessible to all employees for periods of time not to exceed six months.

[Order 72-13, § 296-133-260, filed 7/31/72.]

**WAC 296-133-270 Extensions of time.** Whenever in these rules provision is made for the conducting of a hearing by the authorized agent for the purpose of taking testimony and evidence after the giving of a notice of the time and place of such hearing, the authorized agent may upon his own motion change the time for such hearing to a later date and change the place for such hearing. In addition, any party to the hearing process may upon written application to the authorized agent upon the basis of good cause shown in such application be granted an extension of time and a change of the date or place or both for such hearing which is reasonably convenient to the parties.

[Order 72-13, § 296-133-270, filed 7/31/72.]

**WAC 296-133-280 Impasse-determination.** Whenever either a health care activities employer or the exclusive bargaining representative of the bargaining unit



of such health care activity are of the opinion that an impasse has arisen between the parties in the process of collective bargaining, either party may request the department in writing to determine whether an impasse exists in the collective bargaining process.

For the purpose of these rules and supplementary to section 9 of the act, an impasse in the collective bargaining process will be presumed to have been reached when the parties have not agreed upon a collective bargaining contract and an issue or issues remain upon which neither party is willing to agree, nor make in good faith concessions or make further concessions in good faith, nor agree upon any good faith proposal nor make further proposals in good faith for the settlement of any issue remaining unresolved.

For the purpose of these rules and supplementary to the act, the terms "collective bargaining" means the performance of the mutual obligations of the employer and the bargaining representative of the employees to meet at reasonable times, to confer in good faith with respect to wages, hours and other terms and conditions of employment, or the negotiations of an agreement, or any question arising thereunder, and the execution of a written contract incorporating any agreement reached, but such obligation does not compel either party to agree to a proposal or require the making of a concession.

In any case in which the department is requested to determine whether an impasse has been reached in the collective bargaining process, the authorized agent shall request the parties representing the employer, and the parties representing the exclusive bargaining representative in the negotiations to meet and confer with the authorized agent for the purpose of an informal hearing conference to enable a determination of the facts to be made as to whether an impasse has been reached in the collective bargaining process. For that purpose the authorized agent may take evidence and testimony under oath. If the authorized agent determines that an impasse has been reached in the collective bargaining process, he shall forthwith enter findings and conclusions forming the basis of his belief that an impasse has been reached and setting forth therein the specific issues remaining unresolved between the parties which constitute the impasse accompanied by an order declaring an impasse and ordering the parties to forthwith choose and impanel a board of arbitrators pursuant to the provisions of section 9 of the act. Which order shall further require the parties to furnish copies of the authorized agent's findings and conclusions and order declaring an impasse to each member of the panel of arbitrators for their guidance upon the subject of the issues remaining unresolved constituting the impasse.

If an impasse is found not to have been reached in the process of collective bargaining, the authorized agent shall enter findings and conclusions and order the parties to resume the process of collective bargaining.

[Order 72-13, § 296-133-280, filed 7/31/72.]

[Title 296 WAC—p 1846]

**WAC 296-133-290 Administrative appeals to the director.** Any employer or employee of a health care activity or employee organization or other person or organization who was a party in the proceeding before the authorized agent and aggrieved by any action taken or decision made by any authorized agent may appeal such action or decision to the director of the department of labor and industries by filing a notice of such appeal with the director of the department of labor and industries and the authorized agent within thirty days of such action or decision. The notice of appeal shall be accompanied by a concise numbered statement of the assignments of error which are to be relied upon and are the subject of the appeal. Copies of the notice of appeal and assignments of error shall be served upon all parties to the proceeding before the authorized agent. Proof of such service shall be filed in the office of the director. The notice of appeal may in the discretion of the director suspend such action or decision of the authorized agent pending the determination of the appeal by the director. The director shall review the record and written briefs on appeal filed by the respective parties and may bear oral argument regarding the issues on appeal. The director shall decide the issues raised by the appeal and shall notify all parties in writing of his decision. The decision of the director in the absence of an appeal to the superior court pursuant to the Administrative Procedure Act shall be final at the expiration of thirty days from the date of filing of such decision.

[Order 72-13, § 296-133-290, filed 7/31/72.]

**WAC 296-133-300 Appeal briefs.** Typewritten memoranda of authority or appeal briefs shall be filed in the office of the director by the respective parties to the appeal thirty days following the filing of the notice of appeal. Any party to the appeal filing an appeal brief may request that a hearing of oral arguments upon the appeal be held before the director. Parties to the appeal not filing an appeal brief will not be granted oral hearing of arguments before the director nor permitted to present oral arguments to the director at any hearing that may be held for the presentation of arguments on appeal. The time and place for hearing oral arguments, when requested, will be fixed at the expiration of the time for filing briefs and notice of any such hearing will be sent to all parties to the appeal.

[Order 72-13, § 296-133-300, filed 7/31/72.]

**WAC 296-133-310 Appeal briefs—Contents.** In addition to the cover or title pages of the brief and any index, appeal briefs shall consist of the following subdivisions, titled with distinctive type and in the order indicated:

(1) Statement of the case. Under this heading the following shall be included: A brief statement of the nature of the case which is the subject of the appeal and a clear and concise statement of the facts appropriate to an understanding of the nature of the controversy, with page references to the record on appeal.

(2) Assignments of error. Each error relied upon and served with the notice of appeal shall be clearly pointed

out and discussed under the appropriately designed headings. No alleged error of the authorized agent will be considered unless the same be definitely pointed out in the assignments of error in the appellant's brief. Whenever error is assigned to any findings of fact or conclusion of the authorized agent, so much of the findings or conclusions claimed to be erroneous shall be set out verbatim in the brief.

(3) Argument of counsel for appellant shall set forth and discuss the authorities in support of the position of the appellant and shall be appropriately designed and arranged for discussion and argument of the assignments of error and the issues arising out of such assignments of error with references where appropriate to the record on appeal.

(4) Argument of counsel for respondent. The brief of respondent on appeal need not contain a subdivision containing the assignments of error on appeal, but in the argument of counsel for respondent there shall be directed, under appropriately titled sections, argument and discussion in opposition to the assignments of error of the appellant, or in support of the decision of rulings of the authorized agent and where appropriate with supporting references to the pages of the record on appeal.

[Order 72-13, § 296-133-310, filed 7/31/72.]

**WAC 296-133-320 Record on appeal.** Upon receipt of a copy of the notice of appeal, the authorized agent shall promptly cause to be prepared and forwarded to the office of the director the record on appeal which shall include, a transcript of the proceedings of any hearing held by the authorized agent, the originals of all exhibits or documentary evidence admitted in evidence or rejected in evidence by the authorized agent and any other papers or evidence before the authorized agent relied upon in arriving at his decision. All exhibits shall be appropriately and plainly marked for reference. In addition the authorized agent shall certify in the appropriately titled case the record on appeal as containing all of the evidence, matters and things coming before the authorized agent at the hearing, or relied upon in making his findings, conclusions, decision and any remedial order. A copy of the record on appeal, or any portion thereof, may be obtained by any party to the appeal upon payment to the authorized agent of the reasonable cost per page.

[Order 72-13, § 296-133-320, filed 7/31/72.]

### Chapter 296-134 WAC FAMILY LEAVE

WAC	
296-134-001	Declaration of purpose.
296-134-010	Definitions.
296-134-030	Entitlement to leave.
296-134-040	Notice.
296-134-050	Medical confirmation.
296-134-060	Leave from same employer.
296-134-070	Returning to employment.
296-134-090	Penalties.

(1989 Ed.)

**WAC 296-134-001 Declaration of purpose.** It is in the public interest that employers provide reasonable leave upon the birth or adoption of a child or to allow for the care of a child under eighteen years old with a terminal health condition. This chapter serves to implement chapter 11, Laws of 1989 1st ex. sess., establishing a minimum standard for employee leave in furtherance of family stability and economic security.

These rules are not comprehensive and should be implemented in conjunction with the statutory requirements of chapter 49.78 RCW.

[Statutory Authority: 1989 1st ex.s. c 11. 89-23-044, § 296-134-001, filed 11/13/89, effective 12/14/89.]

**WAC 296-134-010 Definitions.** For the purposes of this chapter:

(1) "Chapter" means this chapter of the Washington Administrative Code or chapter 11, Laws of 1989 1st ex. sess.

(2) "Department" means the department of labor and industries.

(3) "Employee" means a person, other than an independent contractor, employed by an employer on a continuous basis for the previous fifty-two weeks for at least an average of thirty-five hours a week. In computing the average number of hours worked, hours over fifty hours a week shall not be included.

A person is employed on a continuous basis despite a temporary interruption in the performance of the person's job duties if (a) the interruption is caused by the employee taking authorized leave; (b) the interruption is caused by the employer's temporary cessation of all or most operations and the employees do not qualify for unemployment compensation benefits due to a continuing employment relationship, e.g., school employees; or (c) the employee qualified for unemployment compensation benefits as a "stand-by" worker as defined in WAC 192-12-150 for time periods of two weeks or less.

(4) "Employer" means any person, firm, corporation, partnership, business trust, legal representative, or other business entity which engages in any business, industry, profession, or activity in this state, and any unit of local government, which (a) employed a daily average on one hundred or more employees during the last calendar quarter at the place where the employee requesting leave reports for work, or (b) employed a daily average of one hundred or more employees within a twenty mile radius of the place where the employee requesting leave reports for work, the employer maintains a central hiring location and customarily transfers employees among workplaces.

Any employer that has demonstrated the ability to transfer employees between workplaces within the twenty mile radius for the purpose of covering a temporary labor shortage or a permanent or temporary reassignment is considered to be an employer that customarily transfers employees.

A "central hiring location" is an office of the employer or its agent where two or more of the following functions are performed for two or more workplaces:

(i) Employment applications are accepted or screened;

[Title 296 WAC—p 1847]

(ii) Preemployment or employment interviews are conducted;

(iii) Hiring decisions are made.

"Employer" also includes the state, state institutions, and state agencies.

(5) "Infraction" means a violation of chapter 11, Laws of 1989 1st ex. sess. or this chapter, as found by the department.

(6) "Workweek" means a fixed and regularly recurring period of one hundred sixty-eight hours or seven consecutive twenty-four hour periods. It may begin on any day of the week and any hour of the day, and need not coincide with a calendar week.

[Statutory Authority: 1989 1st ex.s. c 11. 89-23-044, § 296-134-010, filed 11/13/89, effective 12/14/89.]

**WAC 296-134-030 Entitlement to leave.** (1) Subject to restrictions within the statute and these rules, an employee is entitled to twelve workweeks of family leave during any twenty-four month period. Use of family leave shall not preclude an employee from using other leave to which the employee is entitled during that period according to the terms of the appropriate collective bargaining agreement or employer leave policy.

(2) Employers may limit or deny family leave to designated key personnel or the highest paid ten percent of the employer's employees in the state.

(a) Designated key personnel may not exceed ten percent of the employer's employees in the state. Key personnel shall be designated based upon criteria determined by the employer which may not include the employee's age or gender or other criteria for the purpose of evading the requirements of this chapter. Any designation of key personnel shall take effect thirty days after the employee is notified.

(b) If the employer chooses to limit or deny family leave to the highest paid ten percent of the employer's employees within the state, the employer shall within forty-five days after a determination notify the employees who fall within the highest paid ten percent. In calculating the highest paid ten percent of the employer's employees within the state, the employer shall include total wages, salary, or bonuses paid. An employer may not limit or deny family leave to the highest paid ten percent of the employer's employees until thirty days after the employees are notified. The notice shall be good for up to one year regardless of changes in compensation and may be changed no more than once in any twelve-month period.

[Statutory Authority: 1989 1st ex.s. c 11. 89-23-044, § 296-134-030, filed 11/13/89, effective 12/14/89.]

**WAC 296-134-040 Notice.** (1) An employee planning to take family leave to care for a newborn or newly adopted child shall provide the employer with written notice at least thirty days in advance of the anticipated date of delivery or adoption, stating the dates during which the employee intends to take family leave. This notice is not intended to substitute for notice to take maternity disability leave which an employer may require.

[Title 296 WAC—p 1848]

(2) Failure of an employee to provide written notice of the intention to take family leave for any authorized reason shall allow an employer to increase or reduce the leave requested by up to three weeks.

[Statutory Authority: 1989 1st ex.s. c 11. 89-23-044, § 296-134-040, filed 11/13/89, effective 12/14/89.]

**WAC 296-134-050 Medical confirmation.** An employer seeking confirmation by an employee's health care provider regarding the date of a child's birth, the date on which incapacity or disability commenced or will probably commence and its probable duration, or the fact that a child has a terminal health condition, shall notify the employee within seven calendar days or five working days of receipt of the employee's notice of leave except where the employer requires medical confirmation as part of the initial leave request. If disputes arise regarding premature birth, incapacitation of the mother, maternity disability, or the terminal condition of a child, the opinions of additional health care providers shall be obtained within fourteen calendar days or ten working days of the employer's receipt of the opinion of the employee's health care provider except where the employee is unable to schedule an appointment or otherwise fails to cooperate or where the employee's doctor is responsible for the delay.

[Statutory Authority: 1989 1st ex.s. c 11. 89-23-044, § 296-134-050, filed 11/13/89, effective 12/14/89.]

**WAC 296-134-060 Leave from same employer.** When both parents of a child are employed by the same employer, the employer may limit the family leave to a total of twelve workweeks during a twenty-four month period. For purposes of this section, an "employer" is the same entity as that defined in WAC 296-134-010(4) for determining the scope of this chapter. Each state agency or institution shall be considered a separate employer.

[Statutory Authority: 1989 1st ex.s. c 11. 89-23-044, § 296-134-060, filed 11/13/89, effective 12/14/89.]

**WAC 296-134-070 Returning to employment.** (1) Subject to the exceptions in subsections (2) and (3) of this section, an employee who exercises any right to family leave under this chapter shall be entitled, upon return from leave or during any reduced leave schedule, to the same position, with the same pay, benefits, hours and shift, as held when the leave commenced, or to a position with equivalent benefits and pay at a workplace within twenty miles of the employee's workplace when leave commenced. Upon a written request of the employee, the employer shall provide a written explanation to the employee if the employee is not allowed to return to the same position.

(2) If the employer's circumstances have changed so that the employee cannot be reinstated to the same position or to a position with equivalent pay and benefits, an employee returning from family leave shall be reinstated in any position which is vacant and for which the employee meets the minimum qualifications. The filling of a position held by an employee on family leave does not by itself constitute changed circumstances.

(1989 Ed.)

(3) Reinstatement of an employee returning from family leave need not occur as provided under subsection (1) or (2) of this section if:

(a) The specific job is eliminated by a bona fide restructuring, or a reduction-in-force resulting from lack of funds or lack of work;

(b) The employee's workplace is completely shut down at the time for at least thirty days;

(c) The employer moves the workplace of the employee to a location at least sixty miles from the location of the workplace with leave commenced;

(d) An employee on family leave takes a position with another employer outside the home; or

(e) The employee fails to provide the required notice of intent to take family leave or fails to return on the established ending date of leave.

[Statutory Authority: 1989 1st ex.s. c 11. 89-23-044, § 296-134-070, filed 11/13/89, effective 12/14/89.]

**WAC 296-134-090 Penalties.** (1) The department may fine an employer up to two hundred dollars for the first infraction of this chapter or its enabling legislation.

(2) An employer that commits three or more infractions within a two-year period shall be considered an employer that continues to violate the statute, subject to a fine of up to one thousand dollars for each infraction. An infraction that affects more than one employee and that an employer refuses to correct within a reasonable time after notification by the department, such as the employer's refusal to display in a conspicuous place a poster informing employees of their rights under this chapter, shall also constitute a continuing violation, subject to a fine of up to one thousand dollars for each day the infraction continues.

[Statutory Authority: 1989 1st ex.s. c 11. 89-23-044, § 296-134-090, filed 11/13/89, effective 12/14/89.]

**Chapter 296-150A WAC**

**RULES AND REGULATIONS FOR FACTORY-BUILT HOUSING AND COMMERCIAL STRUCTURES AND GOVERNOR'S ADVISORY BOARD ADMINISTRATIVE RULES**

**WAC**

- 296-150A-005 Application and scope.
- 296-150A-011 Enforcement.
- 296-150A-016 Definitions.
- 296-150A-021 Insignia of approval—In general.
- 296-150A-024 Filing a design plan.
- 296-150A-030 Requirements for design plans.
- 296-150A-035 Engineering analysis and test procedures.
- 296-150A-040 Department check of the design plan.
- 296-150A-045 Resubmittal of corrected design plan.
- 296-150A-051 Application for approval of a compliance control manual.
- 296-150A-055 Changes to a design plan or an approved compliance control manual.
- 296-150A-060 Renewal of a design plan.
- 296-150A-065 Trade secrets.
- 296-150A-070 Applications for inspection and insignia for factory-built structures and components.
- 296-150A-075 Applications for insignia for factory-built structures and components.

- 296-150A-080 Inspections at a manufacturer's plant by a local enforcement agency, an independent inspection agency, or the manufacturer.
- 296-150A-085 Other inspections by the department.
- 296-150A-090 Action after inspection.
- 296-150A-095 Inspection of factory-built structures after installation at the building site.
- 296-150A-100 Complaint investigations.
- 296-150A-105 Fee required if a structure or component is not ready for inspection.
- 296-150A-110 Alterations.
- 296-150A-115 Application for alteration insignia and approval of alteration.
- 296-150A-120 Lost or damaged insignia.
- 296-150A-125 Notice of noncompliance.
- 296-150A-130 Prohibited sale or lease notice.
- 296-150A-135 Approval of equipment.
- 296-150A-140 Department approval of listing and testing agencies, licensed professional engineers, and licensed architects.
- 296-150A-145 Approval of alternates.
- 296-150A-150 Manufacturing in more than one location.
- 296-150A-155 Change of name, address, or ownership.
- 296-150A-160 Discontinuance of a product line.
- 296-150A-170 Reciprocal agreements.
- 296-150A-300 Construction standards for factory-built structures.

**HEARINGS**

- 296-150A-800 Hearings—Public hearing.
- 296-150A-805 Board of appeals.

**GOVERNOR'S ADVISORY BOARD ADMINISTRATIVE RULES**

- 296-150A-815 Foreword.
- 296-150A-820 Definitions.
- 296-150A-825 Officers.
- 296-150A-830 Internal management.
- 296-150A-835 Duties.
- 296-150A-840 Hearings.
- 296-150A-845 Appearance and practice before the board.
- 296-150A-850 Solicitation of business unethical.
- 296-150A-855 Standards of ethical conduct.
- 296-150A-860 Appearance by former employee.
- 296-150A-865 Former employee as expert witness.
- 296-150A-870 Computation of time.
- 296-150A-875 Administrative Procedure Act.

**HEARINGS**

- 296-150A-950 Hearing on grievances.

**FEES**

- 296-150A-990 Fees.

**DISPOSITION OF SECTIONS FORMERLY CODIFIED IN THIS CHAPTER**

- 296-150A-010 Administration—Authority for factory-built housing and commercial structures code. [Order 77-8, § 296-150A-010, filed 4/29/77; Order 74-15, § 296-150A-010, filed 4/30/74.] Repealed by 82-12-004 (Order 82-19), filed 5/20/82. Statutory Authority: RCW 43.22.475 and 43.22.480.
- 296-150A-015 Application and scope. [Order 77-8, § 296-150A-015, filed 4/29/77; Order 74-15, § 296-150A-015, filed 4/30/74.] Repealed by 82-12-004 (Order 82-19), filed 5/20/82. Statutory Authority: RCW 43.22.475 and 43.22.480.
- 296-150A-020 Department services. [Order 77-8, § 296-150A-020, filed 4/29/77; Order 74-15, § 296-150A-020, filed 4/30/74.] Repealed by 82-12-004 (Order 82-19), filed 5/20/82. Statutory Authority: RCW 43.22.475 and 43.22.480.
- 296-150A-025 Conditions of reciprocity. [Order 77-8, § 296-150A-025, filed 4/29/77; Order 74-15, § 296-150A-025, filed 4/30/74.] Repealed by 82-12-004 (Order 82-19), filed 5/20/82. Statutory Authority: RCW 43.22.475 and 43.22.480.

- 296-150A-026 Acceptance from out-of-state jurisdictions. [Order 77-8, § 296-150A-026, filed 4/29/77; Order 74-15, § 296-150A-026, filed 4/30/74.] Repealed by 82-12-004 (Order 82-19), filed 5/20/82. Statutory Authority: RCW 43.22.475 and 43.22.480.
- 296-150A-027 Educational. [Order 77-8, § 296-150A-027, filed 4/29/77; Order 74-15, § 296-150A-027, filed 4/30/74.] Repealed by 82-12-004 (Order 82-19), filed 5/20/82. Statutory Authority: RCW 43.22.475 and 43.22.480.
- 296-150A-050 Definitions—General. [Order 77-8, § 296-150A-050, filed 4/29/77; Order 74-15, § 296-150A-050, filed 4/30/74.] Repealed by 82-12-004 (Order 82-19), filed 5/20/82. Statutory Authority: RCW 43.22.475 and 43.22.480.
- 296-150A-315 Construction requirements. [Order 77-8, § 296-150A-315, filed 4/29/77; Order 74-15, § 296-150A-315, filed 4/30/74.] Repealed by 82-12-004 (Order 82-19), filed 5/20/82. Statutory Authority: RCW 43.22.475 and 43.22.480.
- 296-150A-320 Electrical requirements. [Order 77-8, § 296-150A-320, filed 4/29/77; Order 75-5, § 296-150A-320, filed 3/5/75; Order 74-15, § 296-150A-320, filed 4/30/74.] Repealed by 82-12-004 (Order 82-19), filed 5/20/82. Statutory Authority: RCW 43.22.475 and 43.22.480.
- 296-150A-325 Mechanical requirements. [Order 77-8, § 296-150A-325, filed 4/29/77; Order 74-15, § 296-150A-325, filed 4/30/74.] Repealed by 82-12-004 (Order 82-19), filed 5/20/82. Statutory Authority: RCW 43.22.475 and 43.22.480.
- 296-150A-330 Plumbing requirements. [Order 77-8, § 296-150A-330, filed 4/29/77; Order 74-15, § 296-150A-330, filed 4/30/74.] Repealed by 82-12-004 (Order 82-19), filed 5/20/82. Statutory Authority: RCW 43.22.475 and 43.22.480.
- 296-150A-333 Handicap standards. [Order 77-8, § 296-150A-333, filed 4/29/77.] Repealed by 82-12-004 (Order 82-19), filed 5/20/82. Statutory Authority: RCW 43.22.475 and 43.22.480.
- 296-150A-335 Code research and materials evaluation service. [Order 74-15, § 296-150A-335, filed 4/30/74.] Repealed by 82-12-004 (Order 82-19), filed 5/20/82. Statutory Authority: RCW 43.22.475 and 43.22.480.
- 296-150A-400 Enforcement and administration—Enforcement. [Order 77-8, § 296-150A-400, filed 4/29/77; Order 74-15, § 296-150A-400, filed 4/30/74.] Repealed by 82-12-004 (Order 82-19), filed 5/20/82. Statutory Authority: RCW 43.22.475 and 43.22.480.
- 296-150A-405 Equipment and systems. [Order 74-15, § 296-150A-405, filed 4/30/74.] Repealed by 82-12-004 (Order 82-19), filed 5/20/82. Statutory Authority: RCW 43.22.475 and 43.22.480.
- 296-150A-410 Department disapproval of listed or labeled equipment and systems. [Order 74-15, § 296-150A-410, filed 4/30/74.] Repealed by 82-12-004 (Order 82-19), filed 5/20/82. Statutory Authority: RCW 43.22.475 and 43.22.480.
- 296-150A-415 Alternates and equivalents. [Order 74-15, § 296-150A-415, filed 4/30/74.] Repealed by 82-12-004 (Order 82-19), filed 5/20/82. Statutory Authority: RCW 43.22.475 and 43.22.480.
- 296-150A-417 Prohibited notice. [Order 77-8, § 296-150A-417, filed 4/29/77.] Repealed by 82-12-004 (Order 82-19), filed 5/20/82. Statutory Authority: RCW 43.22.475 and 43.22.480.
- 296-150A-420 Inspections. [Order 77-8, § 296-150A-420, filed 4/29/77; Order 74-15, § 296-150A-420, filed 4/30/74.] Repealed by 82-12-004 (Order 82-19), filed 5/20/82. Statutory Authority: RCW 43.22.475 and 43.22.480.
- 296-150A-423 Compliance control programs (CC). [Order 77-8, § 296-150A-423, filed 4/29/77; Order 74-15, § 296-150A-423, filed 4/30/74.] Repealed by 82-12-004 (Order 82-19), filed 5/20/82. Statutory Authority: RCW 43.22.475 and 43.22.480.
- 296-150A-424 Factory-built—Compliance control (FB-CC). [Order 77-8, § 296-150A-424, filed 4/29/77; Order 74-15, § 296-150A-424, filed 4/30/74.] Repealed by 82-12-004 (Order 82-19), filed 5/20/82. Statutory Authority: RCW 43.22.475 and 43.22.480.
- 296-150A-425 Local enforcement agency—Compliance control (LEA-CC). [Order 74-15, § 296-150A-425, filed 4/30/74.] Repealed by 82-12-004 (Order 82-19), filed 5/20/82. Statutory Authority: RCW 43.22.475 and 43.22.480.
- 296-150A-430 Local enforcement agency application. [Order 74-15, § 296-150A-430, filed 4/30/74.] Repealed by 82-12-004 (Order 82-19), filed 5/20/82. Statutory Authority: RCW 43.22.475 and 43.22.480.
- 296-150A-435 The local enforcement agency. [Order 74-15, § 296-150A-435, filed 4/30/74.] Repealed by 82-12-004 (Order 82-19), filed 5/20/82. Statutory Authority: RCW 43.22.475 and 43.22.480.
- 296-150A-440 The local enforcement agency responsibility. [Order 77-8, § 296-150A-440, filed 4/29/77; Order 74-15, § 296-150A-440, filed 4/30/74.] Repealed by 82-12-004 (Order 82-19), filed 5/20/82. Statutory Authority: RCW 43.22.475 and 43.22.480.
- 296-150A-445 Manufacturer compliance control (M-CC). [Order 74-15, § 296-150A-445, filed 4/30/74.] Repealed by 82-12-004 (Order 82-19), filed 5/20/82. Statutory Authority: RCW 43.22.475 and 43.22.480.
- 296-150A-450 Independent inspection agency compliance control (IIA-CC). [Order 74-15, § 296-150A-450, filed 4/30/74.] Repealed by 82-12-004 (Order 82-19), filed 5/20/82. Statutory Authority: RCW 43.22.475 and 43.22.480.
- 296-150A-500 Design plan approval—General. [Order 77-8, § 296-150A-500, filed 4/29/77; Order 74-15, § 296-150A-500, filed 4/30/74.] Repealed by 82-12-004 (Order 82-19), filed 5/20/82. Statutory Authority: RCW 43.22.475 and 43.22.480.
- 296-150A-505 Design plan approval application. [Order 74-15, § 296-150A-505, filed 4/30/74.] Repealed by 82-12-004 (Order 82-19), filed 5/20/82. Statutory Authority: RCW 43.22.475 and 43.22.480.
- 296-150A-506 Design plan types and descriptions. [Order 77-15, § 296-150A-506, filed 8/19/77; Order 74-15, § 296-150A-506, filed 4/30/74.] Repealed by 82-12-004 (Order 82-19), filed 5/20/82. Statutory Authority: RCW 43.22.475 and 43.22.480.
- 296-150A-510 Engineering and test procedures. [Order 74-15, § 296-150A-510, filed 4/30/74.] Repealed by 82-12-004 (Order 82-19), filed 5/20/82. Statutory Authority: RCW 43.22.475 and 43.22.480.
- 296-150A-515 Design plan requirements. [Order 77-15, § 296-150A-515, filed 8/19/77; Order 74-15, § 296-150A-515, filed 4/30/74.] Repealed by 82-12-004 (Order 82-19), filed 5/20/82. Statutory Authority: RCW 43.22.475 and 43.22.480.
- 296-150A-516 Technical report. [Order 74-15, § 296-150A-516, filed 4/30/74.] Repealed by 82-12-004 (Order 82-19), filed 5/20/82. Statutory Authority: RCW 43.22.475 and 43.22.480.
- 296-150A-520 Live loads. [Order 77-15, § 296-150A-520, filed 8/19/77; Order 74-15, § 296-150A-520, filed 4/30/74.] Repealed by 82-12-004 (Order 82-19), filed 5/20/82. Statutory Authority: RCW 43.22.475 and 43.22.480.
- 296-150A-521 Plastic DWV piping. [Order 77-15, § 296-150A-521, filed 8/19/77; Order 74-15, § 296-150A-521, filed 4/30/74.] Repealed by 82-12-004 (Order 82-19), filed 5/20/82. Statutory Authority: RCW 43.22.475 and 43.22.480.
- 296-150A-525 Manufacturing in more than one location. [Order 74-15, § 296-150A-525, filed 4/30/74.] Repealed by 82-12-004 (Order 82-19), filed 5/20/82. Statutory Authority: RCW 43.22.475 and 43.22.480.
- 296-150A-530 Out-of-state applicant. [Order 77-8, § 296-150A-530, filed 4/29/77; Order 74-15, § 296-150A-530, filed 4/30/74.] Repealed by 82-12-004 (Order 82-

- 19), filed 5/20/82. Statutory Authority: RCW 43.22-475 and 43.22.480.
- 296-150A-535 Nonconforming application and plans. [Order 74-15, § 296-150A-535, filed 4/30/74.] Repealed by 82-12-004 (Order 82-19), filed 5/20/82. Statutory Authority: RCW 43.22.475 and 43.22.480.
- 296-150A-540 Manufacturers evidence of department approval. [Order 74-15, § 296-150A-540, filed 4/30/74.] Repealed by 82-12-004 (Order 82-19), filed 5/20/82. Statutory Authority: RCW 43.22.475 and 43.22.480.
- 296-150A-545 Design plan approval expiration. [Order 77-15, § 296-150A-545, filed 8/19/77; Order 74-15, § 296-150A-545, filed 4/30/74.] Repealed by 82-12-004 (Order 82-19), filed 5/20/82. Statutory Authority: RCW 43.22.475 and 43.22.480.
- 296-150A-550 Revocation of approval. [Order 74-15, § 296-150A-550, filed 4/30/74.] Repealed by 82-12-004 (Order 82-19), filed 5/20/82. Statutory Authority: RCW 43.22.475 and 43.22.480.
- 296-150A-555 Changes to approved plans. [Order 77-15, § 296-150A-555, filed 8/19/77; Order 74-15, § 296-150A-555, filed 4/30/74.] Repealed by 82-12-004 (Order 82-19), filed 5/20/82. Statutory Authority: RCW 43.22.475 and 43.22.480.
- 296-150A-560 Transfer of approvals. [Order 77-15, § 296-150A-560, filed 8/19/77; Order 74-15, § 296-150A-560, filed 4/30/74.] Repealed by 82-12-004 (Order 82-19), filed 5/20/82. Statutory Authority: RCW 43.22-475 and 43.22.480.
- 296-150A-565 Change of name or address. [Order 74-15, § 296-150A-565, filed 4/30/74.] Repealed by 82-12-004 (Order 82-19), filed 5/20/82. Statutory Authority: RCW 43.22.475 and 43.22.480.
- 296-150A-570 Discontinuance of manufacturer. [Order 74-15, § 296-150A-570, filed 4/30/74.] Repealed by 82-12-004 (Order 82-19), filed 5/20/82. Statutory Authority: RCW 43.22.475 and 43.22.480.
- 296-150A-575 Existing approvals. [Order 74-15, § 296-150A-575, filed 4/30/74.] Repealed by 82-12-004 (Order 82-19), filed 5/20/82. Statutory Authority: RCW 43.22-475 and 43.22.480.
- 296-150A-580 Compliance. [Order 77-15, § 296-150A-580, filed 8/19/77; Order 74-15, § 296-150A-580, filed 4/30/74.] Repealed by 82-12-004 (Order 82-19), filed 5/20/82. Statutory Authority: RCW 43.22.475 and 43.22.480.
- 296-150A-585 Contingency. [Order 77-8, § 296-150A-585, filed 4/29/77.] Repealed by 82-12-004 (Order 82-19), filed 5/20/82. Statutory Authority: RCW 43.22.475 and 43.22.480.
- 296-150A-590 Field erection. [Order 74-15, § 296-150A-590, filed 4/30/74.] Repealed by 82-12-004 (Order 82-19), filed 5/20/82. Statutory Authority: RCW 43.22.475 and 43.22.480.
- 296-150A-595 Proprietary material. [Order 74-15, § 296-150A-595, filed 4/30/74.] Repealed by 82-12-004 (Order 82-19), filed 5/20/82. Statutory Authority: RCW 43.22.475 and 43.22.480.
- 296-150A-600 Insignia—Insignia required. [Order 77-8, § 296-150A-600, filed 4/29/77; Order 74-15, § 296-150A-600, filed 4/30/74.] Repealed by 82-12-004 (Order 82-19), filed 5/20/82. Statutory Authority: RCW 43.22.475 and 43.22.480.
- 296-150A-605 Application for insignia. [Order 77-15, § 296-150A-605, filed 8/19/77; Order 74-15, § 296-150A-605, filed 4/30/74.] Repealed by 82-12-004 (Order 82-19), filed 5/20/82. Statutory Authority: RCW 43.22-475 and 43.22.480.
- 296-150A-606 Notification to local enforcement agency. [Order 77-8, § 296-150A-606, filed 4/29/77; Order 74-15, § 296-150A-606, filed 4/30/74.] Repealed by 82-12-004 (Order 82-19), filed 5/20/82. Statutory Authority: RCW 43.22.475 and 43.22.480.
- 296-150A-610 Alteration or conversion. [Order 77-8, § 296-150A-610, filed 4/29/77; Order 74-15, § 296-150A-610, filed 4/30/74.] Repealed by 82-12-004 (Order 82-19), filed 5/20/82. Statutory Authority: RCW 43.22-475 and 43.22.480.
- 296-150A-615 Denial of insignia. [Order 74-15, § 296-150A-615, filed 4/30/74.] Repealed by 82-12-004 (Order 82-19), filed 5/20/82. Statutory Authority: RCW 43.22-475 and 43.22.480.
- 296-150A-620 Insignia removal. [Order 77-15, § 296-150A-620, filed 8/19/77; Order 74-15, § 296-150A-620, filed 4/30/74.] Repealed by 82-12-004 (Order 82-19), filed 5/20/82. Statutory Authority: RCW 43.22.475 and 43.22.480.
- 296-150A-625 Lost or damaged insignia. [Order 74-15, § 296-150A-625, filed 4/30/74.] Repealed by 82-12-004 (Order 82-19), filed 5/20/82. Statutory Authority: RCW 43.22.475 and 43.22.480.
- 296-150A-630 Custom building. [Order 74-15, § 296-150A-630, filed 4/30/74.] Repealed by 82-12-004 (Order 82-19), filed 5/20/82. Statutory Authority: RCW 43.22-475 and 43.22.480.
- 296-150A-640 Unauthorized use. [Order 74-15, § 296-150A-640, filed 4/30/74.] Repealed by 82-12-004 (Order 82-19), filed 5/20/82. Statutory Authority: RCW 43.22-475 and 43.22.480.
- 296-150A-650 Unit identification. [Order 74-15, § 296-150A-650, filed 4/30/74.] Repealed by 82-12-004 (Order 82-19), filed 5/20/82. Statutory Authority: RCW 43.22-475 and 43.22.480.
- 296-150A-675 Components. [Order 74-15, § 296-150A-675, filed 4/30/74.] Repealed by 82-12-004 (Order 82-19), filed 5/20/82. Statutory Authority: RCW 43.22.475 and 43.22.480.
- 296-150A-680 Components application. [Order 77-15, § 296-150A-680, filed 8/19/77; Order 74-15, § 296-150A-680, filed 4/30/74.] Repealed by 82-12-004 (Order 82-19), filed 5/20/82. Statutory Authority: RCW 43.22-475 and 43.22.480.
- 296-150A-685 Components approval. [Order 74-15, § 296-150A-685, filed 4/30/74.] Repealed by 82-12-004 (Order 82-19), filed 5/20/82. Statutory Authority: RCW 43.22.475 and 43.22.480.
- 296-150A-690 Components testing. [Order 74-15, § 296-150A-690, filed 4/30/74.] Repealed by 82-12-004 (Order 82-19), filed 5/20/82. Statutory Authority: RCW 43.22-475 and 43.22.480.
- 296-150A-695 Components fees and production reports. [Order 77-8, § 296-150A-695, filed 4/29/77; Order 74-15, § 296-150A-695, filed 4/30/74.] Repealed by 82-12-004 (Order 82-19), filed 5/20/82. Statutory Authority: RCW 43.22.475 and 43.22.480.
- 296-150A-700 Fee schedule. [Order 77-8, § 296-150A-700, filed 4/29/77; Order 74-15, § 296-150A-700, filed 4/30/74.] Repealed by 82-12-004 (Order 82-19), filed 5/20/82. Statutory Authority: RCW 43.22.475 and 43.22.480.
- 296-150A-710 Department application forms. [Order 77-15, § 296-150A-710, filed 8/19/77.] Repealed by 82-12-004 (Order 82-19), filed 5/20/82. Statutory Authority: RCW 43.22.475 and 43.22.480.

#### WAC 296-150A-005 Application and scope. (1)

This chapter implements the provisions of RCW 43.22-.450 through 43.22.490, which cover the construction and approval of factory-built structures. The provisions apply to the in-plant inspection of closed construction not inspectable after delivery to the site.

(2) This chapter applies to:

(a) Factory-built structures;

(b) Components; and

(c) Equipment and installations intended to be used in factory-built structures and components.



[Statutory Authority: RCW 43.22.470, 43.22.480 and 43.22.490. 85-05-026 (Order 85-1), § 296-150A-005, filed 2/15/85. Statutory Authority: RCW 43.22.475 and 43.22.480. 82-12-004 (Order 82-19), § 296-150A-005, filed 5/20/82.]

**WAC 296-150A-011 Enforcement.** The department administers and enforces the provisions of this chapter. An officer, agent, or employee of the department may enter any premises, during working hours or at other reasonable times, where structures or components are manufactured, sold, leased, or offered for sale or lease. He or she may examine a manufacturer's compliance control and production records, and may inspect any construction, equipment, or installations to ensure that the manufacturer is complying with this chapter. If necessary to make a proper inspection, he or she may require a manufacturer, dealer, distributor, or consumer to remove part of the structure or component.

[Statutory Authority: RCW 43.22.475 and 43.22.480. 82-12-004 (Order 82-19), § 296-150A-011, filed 5/20/82.]

**WAC 296-150A-016 Definitions.** For the purposes of this chapter:

(1) "Alteration" means the replacement, addition, modification, or removal of any equipment or installations that affect the construction, structural members, fire safety, or occupancy classification, or the plumbing, heating, or electrical systems, of a structure or component.

The following are not alterations unless they are made to repair damage caused by fires, floods, or wrecks in transit or during installation:

- (a) Repairs with approved parts;
  - (b) Modification of a listed fuel-burning appliance in accordance with the terms of its listing;
  - (c) Replacement of equipment with similar equipment; and
  - (d) Adjustment and maintenance of equipment.
- (2) "Approved" means approved by the department.
- (3) "Audit" means an inspection to examine for compliance a manufacturer's production and compliance control procedures.
- (4) "Building site" means a tract, parcel, or subdivision of land on which a structure is or will be installed.
- (5) "Compliance control" means the plan and method for ensuring that the in-plant manufacture, fabrication, assembly, or erection of structures, components, and installations, and the storing, handling, and use of materials, complies with this chapter.
- (6) "Component" means a discrete element that is not inspectable at the time of installation either in the factory or in a site-built unit, but is:
- (a) Designed to be installed in a structure;
  - (b) Manufactured as a unit; and
  - (c) Designed for a particular function or group of functions.

A component may be a floor, wall panel, roof panel, plumbing wall, electrical service wall, heating assembly, or similar assemblies. "Component" includes service cores, but does not include roof trusses.

(7) "Consumer" means a person, firm, corporation, agency, or governmental body, other than a manufacturer or dealer, that buys or leases a structure for his, her, or its own use.

(8) "Custom structure" means a one-of-a-kind structure.

(9) "Dealer" means a person, company, or corporation authorized to engage in the business of leasing, selling, offering for sale or lease, buying, or trading structures.

(10) "Department" means the Washington state department of labor and industries.

(11) "Design option" means a design that a manufacturer may use as an option to its design plan.

(12) "Design plan" means a plan for construction of a structure or component.

(13) "Equipment" means all materials, appliances, devices, fixtures, fittings, or accessories used in the manufacture, assembly, installation, or alteration of structures and components.

(14) "Factory-built structure" means a structure that is designed for occupation or use, or is occupied or used by persons; and that complies with the Uniform Building Code. "Factory-built structure" includes factory-built housing and commercial structures.

(15) "Independent inspection agency" means an organization that is in the business of inspecting structures, components, or equipment.

(16) "Insignia" means a label, stamp, or tag issued by the department to indicate that the structure or component bearing the insignia complies with this chapter.

(17) "Install" means to erect, construct, assemble, or set in place a structure, component, or piece of equipment at a building site or in another structure or building.

(18) "Labeled" means bearing the department's insignia or a label of approval from a testing or listing agency.

(19) "Lease" means an oral or written contract for the use, possession, or occupancy of property. It includes rent.

(20) "Listed" means that a piece of equipment, a component, or an installation appears in a list published by an approved testing or listing agency.

(21) "Listing agency" means an organization that is in the business of approving equipment or installations.

(22) "Local enforcement agency" means a city or county agency that enforces its laws or ordinances governing the construction and installation of structures, components, and buildings that are inspectable at the site.

(23) "Manufacturing" means making, fabricating, forming, or assembling a structure, component, equipment, or installation.

(24) "Structure" means a factory-built structure of closed construction rendering it not inspectable at the site that is entirely or substantially prefabricated or assembled at a factory or a place other than the building site on which the structure will be installed.

(25) "System" means a part of a structure or component that is designed to serve a particular function, such



as a structural, plumbing, electrical, heating, or mechanical system.

(26) "Testing agency" means an organization that is in the business of testing equipment, installations, or systems.

(27) "Closed construction" means a factory assembled structure or component that may enclose a factory-installed mechanical, electrical, or plumbing equipment and is not open for visible inspection of the equipment, systems, or structure at the site.

(28) "Listed factory-built structure and component manufacturer" means a manufacturer who has paid its filing fee and has submitted applications, plans and fees to the FBH-CS Section and by such proposes to manufacture pursuant to these rules and regulations.

(29) "Local enforcement agency compliance control" means an inspection program implemented and maintained by a local enforcement agency under department certification and audit procedures.

(30) "Shell house" means factory-built housing and/or a commercial structure having incomplete construction to such an extent that it is inspectable at the site.

(31) "Service core" means a factory-assembled three-dimensional section of a building that may include installed elements containing mechanical, electrical, plumbing, heating and cooling elements, and related systems. These units may contain the kitchen, one or more bathrooms, and a utility room complex. Service cores are sometimes referred to as wet boxes, mechanical cores, or utility cores.

(32) "Technical service" means research, evaluation, consultation, plan examination, interpretation, and clarification by the department of technical data relating to the application of these rules and regulations, but not including inspections.

[Statutory Authority: RCW 43.22.470, 43.22.480 and 43.22.490. 85-05-026 (Order 85-1), § 296-150A-016, filed 2/15/85. Statutory Authority: RCW 43.22.475 and 43.22.480. 82-12-004 (Order 82-19), § 296-150A-016, filed 5/20/82.]

**WAC 296-150A-021 Insignia of approval--In general.** (1) A manufacturer of a structure or component that is intended to be sold, leased, or used in Washington must obtain an insignia for each structure or component before it sells, leases, or allows the use of the structure or component.

(2) A manufacturer need not obtain an insignia for a component or structure if:

(a) The structure or component is manufactured in Washington but the manufacturer has designated it for delivery, and delivered it to, a purchaser in another state;

(b) The structure or component is delivered in Washington, but is purchased by a common carrier, shipped by the seller via the purchaser, carried under a bill of lading, and the structure or component is transported to a destination in another state;

(c) The structure or component is delivered in Washington, but is purchased from a dealer or manufacturer in another state for use outside this state, and the purchaser transports the structure or component

from Washington to a point outside Washington within 30 days of the date of delivery.

[Statutory Authority: RCW 43.22.475 and 43.22.480. 82-12-004 (Order 82-19), § 296-150A-021, filed 5/20/82.]

**WAC 296-150A-024 Filing a design plan.** (1)(a) A manufacturer of a component or structure must file with the department a design plan for the structure or component. The department will not grant an insignia unless the design plan is filed.

(2)(a) The application must include:

(i) A completed application form. The manufacturer may obtain a form from the department.

(ii) An application for approval of a compliance control manual, if necessary. (See WAC 296-150A-051.)

(iii) One complete set of design plans, specifications, engineering data, and test results, plus one additional complete set for each location at which the manufacturer will manufacture the structure or component.

(iv) The filing fee for the design plan (see WAC 296-150A-990).

(b) If a manufacturer is from out of state, the application must also include a statement from the manufacturer that it agrees to submit to the department annually the names and addresses of all Washington dealers and distributors for the manufacturer's product.

[Statutory Authority: RCW 43.22.475 and 43.22.480. 82-12-004 (Order 82-19), § 296-150A-024, filed 5/20/82.]

**WAC 296-150A-030 Requirements for design plans.**

(1) General requirements. A design plan must include plan and elevation views of the structure or component, and the specifications, engineering data, and test results necessary for a complete evaluation of the design. A manufacturer may submit the specifications, engineering data, and test results separately from the drawings.

If the specifications, engineering data, and test reports are not included on the plan drawings, they must be fastened together. The cover sheet of the plan must note that the documents are part of the plan.

The plan and elevation views for the design plan must be drawn to scale on uniformly sized standard drawing sheets. The applicant must submit prints of the drawings; the department will not accept originals.

The applicant must provide, on the cover or face sheet of the design plan, information that describes the plan, including the plan designation, description of design options, sheet numbers, and titles. The cover sheet should also have space for the department to insert the plan number and the approval date.

The plan must indicate where the manufacturer will affix the insignia to the structure or component. A plan that covers three or more modules must have a "key" drawing to show the arrangement of the modules.

(2) A design plan for factory-built structures, other than one- and two-family dwellings, must be accompanied by a plot plan or side measurements that show the location of the building on the property, the dimensions of the property lines, the dimensions to other buildings on the property, and the fire zone classification.

(3) Specific requirements. The department has numerous specific requirements for design plans. When an applicant intends to file a design plan, it should specify the kind of structure or component it intends to manufacture, and the kind of design plan it intends to submit. The department will send the applicant a copy of the specific requirements.

[Statutory Authority: RCW 43.22.475 and 43.22.480. 82-12-004 (Order 82-19), § 296-150A-030, filed 5/20/82.]

**WAC 296-150A-035 Engineering analysis and test procedures.** (1) When a manufacturer must show that a structural design, method of construction, installation, or piece of equipment is adequate to fulfill its intended function, the manufacturer must submit to the department information on and the results of an engineering analysis or a physical test.

(2) If the manufacturer does an engineering analysis of the design, method, installation, or equipment, the analysis must be made in accordance with generally established principles of engineering and must be signed by an architect or professional engineer licensed in Washington.

(3) If the manufacturer tests the design, method, installation, or equipment, the tests must be performed by a testing agency or an architect or professional engineer licensed in Washington.

Test reports must contain the following items:

- (a) A description of the method or standards that applied to the test;
  - (b) A description and drawings of the item tested;
  - (c) A description of the test set-up;
  - (d) A description of the procedure used to load the item for, and to measure, each condition;
  - (e) Test data (and graphs, where applicable), including pertinent observations of the characteristics and behavior of the item tested;
  - (f) Engineering data; and
  - (g) Analysis, comments, and conclusion.
- (4) The results of the tests or analyses must be in writing and must identify the design plan to which the results relate.

[Statutory Authority: RCW 43.22.475 and 43.22.480. 82-12-004 (Order 82-19), § 296-150A-035, filed 5/20/82.]

**WAC 296-150A-040 Department check of the design plan.** The department shall check a design plan for compliance with this chapter. If the design plan does not comply with this chapter, the department shall notify the applicant in writing, within a reasonable time, of the deficiencies in the plan. The applicant may resubmit a corrected design plan pursuant to WAC 296-150A-045.

If the department does not find any areas in which the design plan does not comply with this chapter, the department will send the applicant a letter stating the applicant's manufacturer number and the plan number for the design plan. The applicant may begin construction of the structure or component upon receipt of the letter from the department.

[Title 296 WAC—p 1854]

The applicant must keep a copy of the design plan at each location at which it is building the structure or component described by the design plan.

[Statutory Authority: RCW 43.22.470, 43.22.480 and 43.22.490. 85-05-026 (Order 85-1), § 296-150A-040, filed 2/15/85. Statutory Authority: RCW 43.22.475 and 43.22.480. 82-12-004 (Order 82-19), § 296-150A-040, filed 5/20/82.]

**WAC 296-150A-045 Resubmittal of corrected design plan.** An applicant who has been notified of deficiencies in its design plan may correct the plan and resubmit it within 90 days after it receives the notice. If the applicant does not meet this deadline, the department may treat the resubmittal as a new application for the design plan.

Each resubmittal must include the minimum resubmittal fee set out in WAC 296-150A-990.

[Statutory Authority: RCW 43.22.475 and 43.22.480. 82-12-004 (Order 82-19), § 296-150A-045, filed 5/20/82.]

**WAC 296-150A-051 Application for approval of a compliance control manual.** (1) A manufacturer of a component must apply, and a manufacturer of a factory-built structure may apply, to the department for approval of a compliance control manual. The application must include:

(a) A completed application form. The manufacturer may obtain a form from the department.

(b) One copy of the compliance control manual plus one additional copy for each location at which the manufacturer will build the structure or component. The copies must be printed on substantial 8 1/2 by 11 inch paper and must be fastened together.

(c) An outline of the compliance control procedure.

(d) The name of the corporate officer, partner, or manager who is responsible for the compliance control program and for maintaining the inspection records for each unit.

(e) An application fee.

(2) If the department has previously approved a compliance control manual for the manufacturer, the manufacturer need not submit copies of the manual with the application.

(3) When the manufacturer asks the department for an application form, it should inform the department of what kind of product it intends to manufacture. The department will send the manufacturer the specific requirements for the compliance control manual.

[Statutory Authority: RCW 43.22.475 and 43.22.480. 82-12-004 (Order 82-19), § 296-150A-051, filed 5/20/82.]

**WAC 296-150A-055 Changes to a design plan or an approved compliance control manual.** If a manufacturer wants to change its design plan or compliance control manual, or a change is required because the department has amended the rules in this chapter, the manufacturer must file the new design plan pursuant to WAC 296-150A-024, or apply for approval of the new compliance control manual pursuant to WAC 296-150A-051.

If the manufacturer must change the design plan or compliance control manual to comply with changes in

this chapter, the manufacturer may continue to manufacture its product under the old design plan or compliance control manual for 90 days after the changes in this chapter become effective. The manufacturer should submit its new design plan or compliance control manual within 30 days after the change takes effect to ensure that the department will have time to examine and approve the plan or manual.

[Statutory Authority: RCW 43.22.475 and 43.22.480. 82-12-004 (Order 82-19), § 296-150A-055, filed 5/20/82.]

**WAC 296-150A-060 Renewal of a design plan.** (1) The filing of a design plan expires 12 months after the date the department notifies the manufacturer that it may begin building structures or components pursuant to the plan.

(2) A manufacturer must apply to the department for renewal of the design plan each year at least one month before the filing expires to ensure that the department will have time to examine the design plan. The manufacturer may obtain an application for renewal of plan filing from the department. The manufacturer must submit:

- (a) A completed application form; and
- (b) The renewal fee required by WAC 296-150A-990. The renewed plan must be identical to the original design plan, except that the manufacturer may change the model name or designation.

[Statutory Authority: RCW 43.22.475 and 43.22.480. 82-12-004 (Order 82-19), § 296-150A-060, filed 5/20/82.]

**WAC 296-150A-065 Trade secrets.** The department will keep confidential all material, design plans, specifications, engineering data, test results, compliance control manuals, and other design information that a manufacturer submits to the department. The department will release this information to public scrutiny only if ordered to do so by a court, or if otherwise required by law.

[Statutory Authority: RCW 43.22.475 and 43.22.480. 82-12-004 (Order 82-19), § 296-150A-065, filed 5/20/82.]

**WAC 296-150A-070 Applications for inspection and insignia for factory-built structures and components.** (1) Inspections in general. A manufacturer of factory-built structures or components must apply to the department for inspections of its products. The department will not issue an insignia for a unit until it has completed inspecting the unit.

The manufacturer may obtain an inspection application form from the department. It must submit the form and an application fee. The department must receive the application at least five days before the proposed date of the inspection.

A manufacturer need not apply to the department for inspection if the department has approved an independent inspection agency, a local enforcement agency, or the manufacturer itself to inspect its products. See WAC 296-150A-080.

Each unit of the manufacturer's product must have a specific serial number to ensure that the department has

inspected each unit. The manufacturer must have the design plan and, if applicable, the approved compliance control manual at the location at which it is manufacturing the product. A manufacturer with a compliance control manual must provide a control card or other compliance control document for each unit.

(2) The department shall generally inspect each factory-built structure and component twice. The department shall make an "OK to cover" inspection of a unit before the electrical, plumbing, mechanical, heating, and structural systems are covered or sealed during the construction. After the unit is completed, the department shall make a "final" inspection.

[Statutory Authority: RCW 43.22.475 and 43.22.480. 82-12-004 (Order 82-19), § 296-150A-070, filed 5/20/82.]

**WAC 296-150A-075 Applications for insignia for factory-built structures and components.** The manufacturer of a factory-built structure or component must apply to the department for an insignia for each unit. The manufacturer may obtain an application form from the department. The manufacturer must submit with the application a fee for each insignia. The department will give an insignia to a manufacturer for installation on a unit if it has received the application and fees, and if the final inspection reveals that the unit complies with this chapter.

[Statutory Authority: RCW 43.22.475 and 43.22.480. 82-12-004 (Order 82-19), § 296-150A-075, filed 5/20/82.]

**WAC 296-150A-080 Inspections at a manufacturer's plant by a local enforcement agency, an independent inspection agency, or the manufacturer.** (1) A manufacturer who wants to be inspected by a local enforcement agency or an independent inspection agency may ask the agency to inspect it. The local enforcement agency or independent inspection agency may do so if it obtains approval from the department.

If the department approves of the agency, it shall by contract allow the agency to perform the inspections. The contract shall require the agency to comply with and enforce the requirements of this chapter, and shall list all manufacturers that the agency may inspect. The parties may amend the contract at any time to add or delete a manufacturer. The manufacturer may obtain the departmental insignia from the agency instead of the department.

(2) A manufacturer may contract with the department to inspect its own products. The contract shall require the manufacturer to comply with and enforce the requirements of this chapter and the manufacturer's compliance control manuals. The contract shall specify the management procedures by which the manufacturer will assure that the inspections are carried out, and shall designate the officer, partner, or owner who is responsible for the inspections.

(3) The department shall audit the agency's or manufacturer's inspections to ensure they are complying with the contract and this chapter. If the agency or manufacturer is not complying with the contract or this chapter,

the department may require the agency or manufacturer to allow the department to perform the inspections.

[Statutory Authority: RCW 43.22.475 and 43.22.480. 82-12-004 (Order 82-19), § 296-150A-080, filed 5/20/82.]

**WAC 296-150A-085 Other inspections by the department.** (1) A person must ask the department to inspect a structure or component if:

(a) The person is selling, leasing, or offering for sale or lease a structure or component that does not bear an insignia and is required to bear an insignia;

(b) The person is altering or has altered the component, or the structure before or during installation of the structure on the building site; or

(c) The department has issued a correction notice and a reinspection is necessary.

(2) An applicant for an inspection must submit an application on forms supplied by the department at least five working days before the desired date of inspection. The applicant must submit with the application an application fee pursuant to WAC 296-150A-990.

(3) For any inspection, the applicant must provide to the department the design plans, specifications, engineering data, and test results on request.

[Statutory Authority: RCW 43.22.475 and 43.22.480. 82-12-004 (Order 82-19), § 296-150A-085, filed 5/20/82.]

**WAC 296-150A-090 Action after inspection.** After an inspection, if the structure or component meets the requirements of this chapter, and the applicant submits completed insignia application forms, insignia fees, and inspection fees, the department shall issue an insignia for the structure or component.

[Statutory Authority: RCW 43.22.475 and 43.22.480. 82-12-004 (Order 82-19), § 296-150A-090, filed 5/20/82.]

**WAC 296-150A-095 Inspection of factory-built structures after installation at the building site.** (1) A manufacturer, dealer, or owner must obtain the approval of the local enforcement agency for each installation of a factory-built structure at a building site. After the department performs a final inspection of a unit, it may send a notice to the local enforcement agency that specifies what connections, standards, and items the agency should check when the unit is installed.

(2) The local enforcement agency may require the manufacturer to provide a set of design plans and specifications for the unit, and to obtain all necessary permits, before it allows the manufacturer to transport the unit to the building site.

(3) The local enforcement agency may not open for inspection any factory-built structure or component that bears the department's insignia.

(4) The local enforcement agency shall notify the department if a unit has been damaged en route to the building site, or during installation, so that the department can inspect the damage to the unit.

[Statutory Authority: RCW 43.22.475 and 43.22.480. 82-12-004 (Order 82-19), § 296-150A-095, filed 5/20/82.]

[Title 296 WAC—p 1856]

**WAC 296-150A-100 Complaint investigations.** A person may complain in writing within one year after occupancy to the department about a structure or component. The complaint should describe the items that the person feels do not comply with this chapter. The department will send a copy of the complaint to the manufacturer and the dealer. The manufacturer and dealer have 30 days to respond. The department shall base its actions on the response.

If the department decides an investigation is necessary and discovers that the unit inspected violates this chapter, the manufacturer or dealer shall pay the cost of the inspection. If the department does not discover any violations, the complainant must pay the fees.

[Statutory Authority: RCW 43.22.470, 43.22.480 and 43.22.490. 85-05-026 (Order 85-1), § 296-150A-100, filed 2/15/85. Statutory Authority: RCW 43.22.475 and 43.22.480. 82-12-004 (Order 82-19), § 296-150A-100, filed 5/20/82.]

**WAC 296-150A-105 Fee required if a structure or component is not ready for inspection.** If a manufacturer or person applies to the department for an inspection of a structure or component, and the structure or component is not ready to be inspected at the time or place specified in the application, the manufacturer or person must pay the department the minimum inspection fee and any travel and per diem expenses.

[Statutory Authority: RCW 43.22.470, 43.22.480 and 43.22.490. 85-05-026 (Order 85-1), § 296-150A-105, filed 2/15/85. Statutory Authority: RCW 43.22.475 and 43.22.480. 82-12-004 (Order 82-19), § 296-150A-105, filed 5/20/82.]

**WAC 296-150A-110 Alterations.** (1) No person may alter a factory-built structure before or during the installation of the factory-built structure unless the person has first applied for and obtained the department's approval of the alteration. "Alteration" is defined in WAC 296-150A-016(1).

(2) If a person alters a structure in violation of subsection (1), the insignia affixed to the structure is void and may be confiscated by the department.

[Statutory Authority: RCW 43.22.475 and 43.22.480. 82-12-004 (Order 82-19), § 296-150A-110, filed 5/20/82.]

**WAC 296-150A-115 Application for alteration insignia and approval of alteration.** (1) If a person proposes to alter a factory-built structure before or during the installation of the factory-built structure, the person must file an application for an alteration insignia and an alteration fee with the department. The person may obtain an application form from the department.

(2) As a condition to approval of an alteration, the department may require inspections of the structure during the alteration to ensure that the alteration complies with this chapter. If the department indicates that inspections are required, the person altering the structure must apply for inspections pursuant to WAC 296-150A-085.

After the final inspection of the alteration, if the alteration complies with this chapter and the applicant has paid the inspection and insignia fees, the department shall issue an insignia for the altered structure.

[Statutory Authority: RCW 43.22.475 and 43.22.480. 82-12-004 (Order 82-19), § 296-150A-115, filed 5/20/82.]

**WAC 296-150A-120 Lost or damaged insignia.** If an insignia is lost or damaged after it is affixed to a structure or component, the manufacturer, owner, or user must notify the department in writing immediately. The manufacturer or owner must specify the manufacturer, the vehicle identification number or serial number of the structure, and the insignia number if possible. The manufacturer, owner, or user must also return a damaged insignia if possible.

The department shall replace a damaged or lost insignia on payment of the insignia replacement fee pursuant to WAC 296-150A-990.

[Statutory Authority: RCW 43.22.475 and 43.22.480. 82-12-004 (Order 82-19), § 296-150A-120, filed 5/20/82.]

**WAC 296-150A-125 Notice of noncompliance.** If an inspection or investigation reveals that a structure or component does not comply with this chapter, the department shall give or mail a notice of noncompliances to the owner, dealer, manufacturer, or other person responsible for the noncompliance. The notice of noncompliance shall describe how the structure or component does not comply with this chapter.

A person who receives a notice of noncompliances must, within ten days after receipt, notify the department in writing of the action he or she has taken or will take to correct the noncompliance. If the person has not corrected the noncompliance within ten days after receipt of the notice, or within any other period of time allowed by the department, the department may confiscate the insignia assigned to the structure or component.

No person who has received a notice of noncompliances may move, cause to be moved, or allow another person to move the structure or component to which the notice refers until the noncompliances have been corrected, the corrections have been inspected and approved by the department, and the person has paid the appropriate inspection and insignia fees.

[Statutory Authority: RCW 43.22.470, 43.22.480 and 43.22.490. 85-05-026 (Order 85-1), § 296-150A-125, filed 2/15/85. Statutory Authority: RCW 43.22.475 and 43.22.480. 82-12-004 (Order 82-19), § 296-150A-125, filed 5/20/82.]

**WAC 296-150A-130 Prohibited sale or lease notice.** If an inspection or investigation reveals that a structure violates this chapter, the department may post the structure with a prohibited sale or lease notice. No person may sell or lease a structure that is posted with a prohibited sale or lease notice. No person may remove, cause to be removed, or allow to be removed a prohibited sale or lease notice until the violations have been corrected, the corrections have been inspected and approved by the department, and the person has paid the appropriate inspection and insignia fees.

The department may also prohibit the occupancy or use of a structure if it is not occupied or used at the time the violation is discovered.

[Statutory Authority: RCW 43.22.475 and 43.22.480. 82-12-004 (Order 82-19), § 296-150A-130, filed 5/20/82.]

**WAC 296-150A-135 Approval of equipment.** Equipment used in the body and frame, or the fire safety, plumbing, heating, mechanical, and electrical systems of structures and components must comply with this chapter and must be approved by the department. The department may approve equipment that is listed or labeled by an approved testing or listing agency. The department may approve equipment that is not listed or labeled if it determines that the equipment is adequate to protect health and safety.

The department may refuse to approve equipment that is listed or labeled if it determines that the equipment is not adequate to protect health and safety.

[Statutory Authority: RCW 43.22.475 and 43.22.480. 82-12-004 (Order 82-19), § 296-150A-135, filed 5/20/82.]

**WAC 296-150A-140 Department approval of listing and testing agencies, licensed professional engineers, and licensed architects.** (1) The department will consider the following information in determining whether to approve a listing or testing agency, professional engineer, or licensed architect:

- (a) The names of agents or officers;
- (b) The location of offices;
- (c) A description of services the agency, engineer, or architect furnishes or proposes to furnish;
- (d) A description of the employees' qualifications and responsibilities;
- (e) A summary of the agency's, engineer's, or architect's experience;
- (f) A description of the procedures and facilities the agency, engineer, or architect will use to evaluate a product, inspect the product manufacturer's operations and compliance control, and label the units of a product;
- (g) A description of the specific information the agency, engineer, or architect will furnish with its listings;
- (h) A description of how the agency, engineer, or architect will deal with errors in its procedures that result in defective or unacceptable products;
- (i) Proof of independence and absence of conflict of interest; and
- (j) A published directory that includes a list of product manufacturers and product information.

(2) To obtain departmental approval, a listing or testing agency, professional engineer, or licensed architect may not be under the control of a manufacturer, dealer, or supplier for the structures, components, equipment, or installations that it approves or lists.

A listing or testing agency must publish at least annually a list of the equipment, components, or installations it has approved. The listing must certify that the equipment, components, and installations have been tested and meet nationally approved standards and must specify the permissible uses for the equipment, components, and installations.

A listing agency must periodically inspect the manufacture of equipment, components, and installations that it has approved. A testing agency must test at least annually the equipment, components, and installations it has approved.

[Statutory Authority: RCW 43.22.475 and 43.22.480. 82-12-004 (Order 82-19), § 296-150A-140, filed 5/20/82.]

**WAC 296-150A-145 Approval of alternates.** The department may approve the use of an alternative design, material, appliance, system, device, arrangement, or method of construction if this chapter does not specifically proscribe the use of the alternative, and the alternative equals or betters the quality, strength, effectiveness, fire resistance, durability, and safety of the design, material, appliance, system, device, arrangement, or method of construction required by this chapter.

[Statutory Authority: RCW 43.22.475 and 43.22.480. 82-12-004 (Order 82-19), § 296-150A-145, filed 5/20/82.]

**WAC 296-150A-150 Manufacturing in more than one location.** A manufacturer that is manufacturing its product at more than one location must notify the department in writing of each location. Manufacturers of factory-built structures must keep a design plan and may be required to keep an approved compliance control manual at each location.

[Statutory Authority: RCW 43.22.475 and 43.22.480. 82-12-004 (Order 82-19), § 296-150A-150, filed 5/20/82.]

**WAC 296-150A-155 Change of name, address, or ownership.** If a manufacturer changes its name or address, it must notify the department in writing of the change within ten days. The notice must be accompanied with the appropriate fee.

If a manufacturer changes ownership, the new owner must notify the department in writing within ten days. The notice must be accompanied with the appropriate fee. The new owner need not file its design plan if it continues to manufacture the product in accordance with a previously filed design plan.

[Statutory Authority: RCW 43.22.475 and 43.22.480. 82-12-004 (Order 82-19), § 296-150A-155, filed 5/20/82.]

**WAC 296-150A-160 Discontinuance of a product line.** When a manufacturer discontinues producing a product that it is manufacturing pursuant to a design plan, the manufacturer must notify the department in writing within ten days and must return all insignia issued to the manufacturer for that product.

[Statutory Authority: RCW 43.22.475 and 43.22.480. 82-12-004 (Order 82-19), § 296-150A-160, filed 5/20/82.]

**WAC 296-150A-170 Reciprocal agreements.** In accordance with RCW 43.22.485, the director has examined the statutes and rules of several states and finds that the statutes and rules provide construction standards that are equal to those of Washington, and that the states enforce their statutes and rules. The department has entered into reciprocal agreements with those states. The department has all reciprocal agreements on file at the factory-assembled structures section. The public may inspect and copy the agreements during regular business hours.

[Statutory Authority: RCW 43.22.475 and 43.22.480. 82-12-004 (Order 82-19), § 296-150A-170, filed 5/20/82.]

[Title 296 WAC—p 1858]

**WAC 296-150A-300 Construction standards for factory-built structures.** Factory-built structures shall comply with the following codes as adopted by the state building code council in chapters 51-12 and 51-16 WAC and as thereafter amended, except where a state law supersedes a code provision.

(1)(a) The design and fabrication of factory-built structures must comply with the Uniform Building Code, Appendix (except for chapter 35), and Standards. The "building official" mentioned in the Uniform Building Code means the assistant director of the department's building and construction safety inspection services division or his or her authorized representative.

(b) Live loading designs must comply with the Uniform Building Code. Live loading for roofs must comply with Section 2305(d), Snow Loads, and may not be less than twenty-five pounds per square foot.

(2) Electrical equipment, installations, and systems in or on factory-built housing and commercial structures must comply with the National Electrical Code published by the National Fire Protection Association, as amended by chapter 19.28 RCW and the rules adopted under that chapter.

(3) Mechanical equipment, installations, and systems in or on factory-built housing and commercial structures must comply with the Uniform Mechanical Code published by the International Association of Plumbing and Mechanical Officials, including Appendix B of chapter 22 and the standards.

(4)(a) Plumbing equipment, installations, and systems in or on factory-built housing and commercial structures must comply with the Uniform Plumbing Code published by the International Association of Plumbing and Mechanical Officials. The code, however, shall not apply to gas piping, water heaters, or vents for water heaters.

(b) A manufacturer may not use plastic drain, waste, or vent pipe for laundries, laundromats, cleaners, service stations, repair garages, restaurants, snack bars, hospitals, nursing homes, medical clinics, manufacturing plants, factories, assembly buildings, theatres, or schools, or other buildings used for education, unless the pipes will carry only domestic sewage.

(5) All factory-built structures that are not residential dwellings must comply with the rules adopted pursuant to RCW 19.27.030(5), which requires manufacturers to make buildings and facilities accessible to and usable by the physically handicapped and elderly persons.

(6)(a) All factory-built structures must comply with the Washington State Energy Code set by chapter 51-12 WAC.

(b) Portable classrooms shall also comply with the following space comfort control requirements.

(7) Mechanical ventilation.

(a) Portable classrooms shall be provided with a tempered air mechanical ventilation system, automatically controlled.

(b) The air supply volume shall be no less than 1.3 cubic feet per minute (c.f.m.) per square foot of floor area in portable classrooms.

(c) The system shall be provided with an economizer cycle to automatically mix recirculated air and outside



air, to provide atmospheric cooling. The air supply system shall be arranged to modulate the amount of outdoor air from minimum setting to one hundred percent outside air during the nonheating period.

(d) The minimum amount of outside air introduced after the room is up to setpoint temperature during occupancy shall be not less than 10 c.f.m. per occupant.

(8) Heating. The system shall provide a temperature differential in the occupied zone not to exceed plus or minus 2°F. Air supply systems shall be provided with a means to discharge air which shall not generate a noise level over 35 N.C. The terminal air velocities in occupied zone shall not exceed 50 feet per minute (f.p.m.).

(9) Temperature control. A system of automatic temperature controls shall be provided which will automatically maintain space setpoint temperature, 72°F heating, 78°F cooling, if cooling is provided, including night setback operation with intermittent fan operation, zero percent outside air and night setback temperature (55°F). Controls shall include seven day scheduling.

(10) Cooling. Mechanical refrigeration is optional. Cooling systems shall be of sufficient capacity to maintain cooling setpoint previously mentioned, under A.S.H.R.A.E. design conditions for the location in which the portable classroom is installed based on 2.5 percentile—dry and wet bulb temperatures. Ventilation rate shall be 10 c.f.m. (cu.ft./min.) per occupant under mechanical cooling cycle operation.

(11) Professional design requirements. Portable classroom design drawings shall incorporate a heating, ventilating (and air conditioning where applicable) design prepared by a professional engineer, registered in Washington state, and experienced in the heating, ventilating and air conditioning field. The engineer's seal shall be affixed to said drawings.

[Statutory Authority: RCW 43.22.475 and 43.22.480. 86-19-081 (Order 86-21), § 296-150A-300, filed 9/17/86. Statutory Authority: RCW 43.22.470, 43.22.480 and 43.22.490. 85-05-026 (Order 85-1), § 296-150A-300, filed 2/15/85. Statutory Authority: RCW 43.22.475 and 43.22.480. 82-12-004 (Order 82-19), § 296-150A-300, filed 5/20/82.]

## HEARINGS

**WAC 296-150A-800 Hearings—Public hearing.** Any public hearing relating to any code, standards, or regulations relating to chapter 157 or modifications considered for adoption by the department shall comply with the requirements of the A.P.A. for the state of Washington.

[Order 74-15, § 296-150A-800, filed 4/30/74.]

**WAC 296-150A-805 Board of appeals.** In cases where the interpretation of the applicable code and application of the standards, rules and regulations herein prescribed as in dispute, or in doubt, the board of appeals hereinafter provided for shall, upon application of any interested person, firm or corporation, determine the methods of construction, installation and/or material, device, appliances or equipment to be used in the particular case submitted for its decision.

In case any decision under this chapter is required by a board of appeals, the director of labor and industries shall designate and appoint such board which shall consist of six members who are qualified by experience and training to pass upon matters pertaining to the construction of factory-built housing and commercial structures. Such appointments to be confirmed by the factory-built housing and commercial structures advisory board. The building official shall be an ex officio member and shall act as secretary of the board. In case of inability of any member appointed to act in any matter, the director of labor and industries shall appoint some other person qualified under this chapter in the place of such person. A majority of the members of such board shall constitute a quorum to transact any business or decide any matters submitted to such board; and decisions and rulings of the board shall be made by majority vote of the appeals board members present. The decision of the board in all matters submitted to it shall be final, conclusive, and binding on all parties. The board shall adopt reasonable rules and regulations for conducting its investigations and shall render all decision and findings in writing to the building official with a duplicate copy to the appellant. Each member of the board shall be paid while in session a per diem of \$25.00 and shall receive in addition thereto necessary traveling expenses which per diem and expenses shall be paid out of the deposit required in case of an appeal; or if such deposit be returned to the appellant as herein provided, or be insufficient for that purpose, such per diem and expenses shall be paid out of the budget of the factory-built housing and commercial structures section, upon vouchers approved by the director of labor and industries.

Any person, firm or corporation desiring a ruling or decision of the board of appeals on any question of interpretation of the rules, regulations and standards, or proper application of the rules, regulations and standards prescribed by this chapter shall, in writing, notify the director of labor and industries of such desire and shall accompany the notice with a certified check payable to the director of labor and industries in the sum of \$150.00; such notice shall specify the ruling or interpretation desired and the contention of such person, firm or corporation as to the proper interpretation or application on the question on which a ruling or decision is desired; and in event the board of appeals shall determine that the contention of the applicant for decision or ruling was proper, the certified check shall be returned to such applicant; otherwise the same shall be used insofar as necessary in paying the expenses and per diem of the members of the board of appeals in connection with such matter; and any portion of said \$150.00 not used in paying the per diem and expenses of said board in said case shall, by the director of labor and industries, be paid into the factory-built housing-commercial structures fund.

[Order 77-8, § 296-150A-805, filed 4/29/77; Order 74-15, § 296-150A-805, filed 4/30/74.]



**GOVERNOR'S ADVISORY BOARD  
ADMINISTRATIVE RULES**

**WAC 296-150A-815 Foreword.** The factory-built housing-commercial structures law, chapter 43.22 RCW, establishes the governor appointed factory-built housing and commercial structures advisory board and fixes its administrative responsibilities. The advisory board's principle function is to assist the director of labor and industries in adopting and promulgating reasonable rules and regulations in furtherance of health, safety and property by assuring that all factory-built housing and commercial structures are structurally sound and that the plumbing, heating, electrical and other components thereof are reasonably safe. It is understood that WAC 296-150A-805 contains the procedure for the appointment of a board of appeals by the director of labor and industries which may include individual members of the factory-built housing and commercial structures advisory board. However, the advisory board itself will not function as a board of appeals nor will it render decisions concerning the application or interpretation of any adopted rules and regulations to any person, firm or corporation engaged in the business of constructing factory-built and commercial structures.

The primary purpose of the following rules is to provide a uniform procedure whereby persons, firms or corporations interested in communicating with the department of labor and industries on any subject matter relative to rules or regulations which should be adopted, amended or repealed for factory-built housing and commercial structures in the state of Washington, or relative to the operation of the factory-built housing-commercial structures section of such department may be heard.

[Order 74-15, § 296-150A-815, filed 4/30/74.]

**WAC 296-150A-820 Definitions.** Whenever used in these rules, the words:

**Board:** Shall mean the Washington state factory-built housing and commercial structures advisory board appointed by the governor pursuant to our RCW 43.22.475.

**Department:** Shall mean the department of labor and industries of the state of Washington.

**Director:** Shall mean the director of the department of labor and industries.

**Regular meeting:** Shall mean the quarterly meetings held by the board on the third Thursday of the first month of each calendar quarter, being January, April, July and October.

**Special meeting:** Shall mean any meeting of the board called by the chairman thereof or the director and held at times other than the regular meetings.

[Order 74-15, § 296-150A-820, filed 4/30/74.]

**WAC 296-150A-825 Officers.** The officers shall consist of the chairman, vice chairman, and secretary of the board. The chairman shall serve a one-year term, and shall have previously served as vice chairman of the board. In the event that a previous vice chairman is not

available to serve as chairman the rules will be suspended and a special election held to fill the office of chairman from the membership of the board. The building official shall serve as an ex officio member and shall act as secretary of the board.

[Order 74-15, § 296-150A-825, filed 4/30/74.]

**WAC 296-150A-830 Internal management.** The board shall adopt written rules of procedure for its internal management which shall include *Roberts Rules or Order, Revised*, copies of which rules of procedure shall be made available to interested persons on written request.

[Order 74-15, § 296-150A-830, filed 4/30/74.]

**WAC 296-150A-835 Duties.** 1. The board shall study proposed rules and regulations submitted to it by the director or by the factory-built housing-commercial structures section of the department and shall make recommendations to the director concerning their adoption and promulgation.

2. The board shall further develop and submit for consideration to the director administrative procedures, organizational plans and rules relating to improving the functions of the factory-built housing-commercial structures section.

3. The board shall at each regular or special meeting consider any written proposals made by any persons, firms or corporations for new rules or regulations or for amendments to or repeal of existing factory-built housing-commercial structures rules or regulations, or for changes in administrative procedures of the factory-built housing-commercial structures section provided such proposals are submitted in writing to the secretary of the board at least fifteen days prior to any such meeting so that the same may be properly included on the agenda for such a meeting.

[Order 74-15, § 296-150A-835, filed 4/30/74.]

**WAC 296-150A-840 Hearings.** Any person, firm or corporation desiring to be heard on any subject matter relative to rules or regulations which should be adopted, amended or repealed for factory-built housing and commercial structures construction in the state of Washington, or relative to the operation of the factory-built housing-commercial structures section of such department at any regular meeting of the board shall present a written request to that effect to the secretary of the board at least fifteen days prior to the next regular meeting, setting forth a summary of any and all proposals on which the hearing is requested.

[Order 74-15, § 296-150A-840, filed 4/30/74.]

**WAC 296-150A-845 Appearance and practice before the board.** No person may appear in a representative capacity before the board other than the following:

1. Attorneys-at-law duly qualified and entitled to practice before the supreme court of the state of Washington.

2. Attorneys-at-law duly qualified and entitled to practice before the highest court of record of any other state, if the attorneys-at-law of the state of Washington are permitted to appear in a representative capacity before administrative agencies of such other state, and if not otherwise prohibited by Washington state law.

3. A bona fide owner, officer, partner, or full-time employee of an individual, firm, association, organization, partnership or corporation who appears for such individual, firm, association, organization, partnership or corporation, or a person (other than an attorney-at-law as provided in subparagraph 1 and 2 above) appointed in writing to represent an individual, firm, association, organization, partnership or corporation.

[Order 74-15, § 296-150A-845, filed 4/30/74.]

**WAC 296-150A-850 Solicitation of business unethical.** It shall be unethical for persons acting in a representative capacity before the board to solicit business by circulars, advertisements, or by personal communication or interviews not warranted by personal relations, provided that such representatives may publish or circulate business cards. It is equally unethical to procure business by solicitors of any kind.

[Order 74-15, § 296-150A-850, filed 4/30/74.]

**WAC 296-150A-855 Standards of ethical conduct.** All persons appearing in proceedings before the board in a representative capacity shall conform to the standards of ethical conduct required of attorneys before the courts of Washington. If any such person does not conform to such standards, the board may decline to permit such person to appear in a representative capacity in any proceeding before the board.

[Order 74-15, § 296-150A-855, filed 4/30/74.]

**WAC 296-150A-860 Appearance by former employee.** No former employee of the board or member of the attorney general's staff may at any time after severing his employment with the board or the attorney general appear, except with the written permission of the board in a representative capacity on behalf of other parties in any proceeding wherein he previously took an active part as a representative of the board.

[Order 74-15, § 296-150A-860, filed 4/30/74.]

**WAC 296-150A-865 Former employee as expert witness.** No former employee of the board shall at any time after severing his employment with the board appear, except with the written permission of the board, as an expert witness on behalf of other parties in any proceeding wherein he previously took an active part in the investigation as representative of the board.

[Order 74-15, § 296-150A-865, filed 4/30/74.]

**WAC 296-150A-870 Computation of time.** In computing any period of time prescribed or allowed by the board rules, by order of the board or by any applicable statute, the day of the act, event, or default after which the designated period of time begins to run is not to be

included. The last day of the period so computed is to be included.

[Order 74-15, § 296-150A-870, filed 4/30/74.]

**WAC 296-150A-875 Administrative Procedure Act.** All proceedings regarding supplemental rules and regulations shall comply, where applicable, with the provisions of the Administrative Procedure Act chapter 34.04 RCW, and any amendments thereto.

[Order 74-15, § 296-150A-875, filed 4/30/74.]

**HEARINGS**

**WAC 296-150A-950 Hearing on aggrievances.** A person who is aggrieved by an order, notice, or decision of the department under this chapter may request a hearing. The request must be in writing and must describe briefly the cause of the grievance.

The director of the department may hear the matter, or may assign the hearing to his or her representative. The department shall notify the complainant of the time, date, and place for the hearing. The hearing shall be held no later than 30 days after the department receives the request for the hearing. If the complainant fails to appear at the scheduled hearing, the department may dismiss the matter.

Upon conclusion of the hearing, the director or his or her representative shall notify the petitioner in writing of his or her decision in the matter.

[Statutory Authority: RCW 43.22.475 and 43.22.480. 82-12-004 (Order 82-19), § 296-150A-950, filed 5/20/82.]

**FEEES**

**WAC 296-150A-990 Fees.**

- (1) Initial manufacturer filing fee: \$ 35.00
- (2)(a) Fee for filing a design plan: \$100.00
- (b) Fee for resubmittal of a design plan: \$ 50.00
- (3) Design plan renewal fees.
- (a) Renewal of an unexpired and unrevoked design plan: \$ 35.00
- (b) Renewal of an expired or revoked design plan: \$100.00
- (4) Fee for transfer of design plan approval to a different manufacturer: \$140.00
- (5) Fees related to compliance control programs.
- (a) Fee for filing a component compliance control manual: \$ 14.00

- (b) Fee for filing a factory-built structure compliance control manual: \$350.00
- (c) Fee for resubmittal of a factory-built structure compliance control manual: \$140.00
- (d) Fee for revisions to a factory-built structure compliance control manual: \$ 14.00  
per page up to \$ 70.00 maximum.
- (e) Transfer of approval of a factory-built structure compliance control manual: \$125.00
- (6) Fee for inspections and other services performed by the department: \$50.00 minimum plus \$25.00 for every half-hour or fraction of a half-hour over one hour.
- (7) Insignia fees.
  - (a) For each single section factory-built structure, or for the first section of a multiple section factory-built structure: \$140.00
  - (b) For each additional section of a multiple section factory-built structure: \$ 14.00
  - (c) For each service core: \$ 70.00
  - (d) For each component other than a service core: \$ 14.00
  - (e) For each reissuance of a factory-built structure insignia: \$ 35.00
  - (f) For each alteration insignia: \$ 14.00
- (8) Fee for a notification to a local enforcement agency: \$ 21.00

- (9) Travel fees and expenses. If a manufacturer or other person outside the state of Washington requests an inspection or other technical service outside the state, the manufacturer must pay the travel expenses of the department's employees. The expenses shall be calculated pursuant to the following list:
  - (a) Surface travel, per mile: \$ .185
  - (b) Air travel: Cost of air fare based published rates.
  - (c) Hourly charge for travel time: \$ 35.00 per half-hour or fraction of a half-hour.
  - (d) Expenses include, but are not limited to, car rental, parking lot charges, and personal expenses. Personal expenses, including food, lodging, and per diem, shall be calculated pursuant to the allowances set by the Washington state office of financial management.
- (10) Fee for change in manufacturer's name, address, or ownership: \$ 21.00

[Statutory Authority: RCW 43.22.440, 43.22.475 and 43.22.480. 82-12-040 (Order 82-20), § 296-150A-990, filed 5/28/82. Statutory Authority: RCW 43.22.475 and 43.22.480. 82-12-004 (Order 82-19), § 296-150A-990, filed 5/20/82.]

**Chapter 296-150B WAC  
STANDARDS FOR MOBILE HOMES,  
COMMERCIAL COACHES, AND RECREATIONAL  
VEHICLES**

- WAC
- 296-150B-005 Application and scope.
  - 296-150B-010 Enforcement.
  - 296-150B-015 Definitions.
  - 296-150B-020 Insignia of approval—In general.
  - 296-150B-025 Application for approval of a design plan.
  - 296-150B-030 Requirements for design plans.
  - 296-150B-035 Engineering analysis and test procedures.
  - 296-150B-040 Department approval of the design plan.
  - 296-150B-045 Resubmittal of corrected design plan.

- (b) Fee for filing a factory-built structure compliance control manual: \$350.00
- (c) Fee for resubmittal of a factory-built structure compliance control manual: \$140.00
- (d) Fee for revisions to a factory-built structure compliance control manual: \$ 14.00  
per page up to \$ 70.00 maximum.
- (e) Transfer of approval of a factory-built structure compliance control manual: \$125.00
- (6) Fee for inspections and other services performed by the department: \$50.00 minimum plus \$25.00 for every half-hour or fraction of a half-hour over one hour.
- (7) Insignia fees.
  - (a) For each single section factory-built structure, or for the first section of a multiple section factory-built structure: \$140.00
  - (b) For each additional section of a multiple section factory-built structure: \$ 14.00
  - (c) For each service core: \$ 70.00
  - (d) For each component other than a service core: \$ 14.00
  - (e) For each reissuance of a factory-built structure insignia: \$ 35.00
  - (f) For each alteration insignia: \$ 14.00
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- (d) Expenses include, but are not limited to, car rental, parking lot charges, and personal expenses. Personal expenses, including food, lodging, and per diem, shall be calculated pursuant to the allowances set by the Washington state office of financial management.
- (10) Fee for change in manufacturer's name, address, or ownership: \$ 21.00

[Statutory Authority: RCW 43.22.440, 43.22.475 and 43.22.480. 82-12-040 (Order 82-20), § 296-150A-990, filed 5/28/82. Statutory Authority: RCW 43.22.475 and 43.22.480. 82-12-004 (Order 82-19), § 296-150A-990, filed 5/20/82.]

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  - 296-150B-015 Definitions.
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  - 296-150B-030 Requirements for design plans.
  - 296-150B-035 Engineering analysis and test procedures.
  - 296-150B-040 Department approval of the design plan.
  - 296-150B-045 Resubmittal of corrected design plan.

- 296-150B-050 Application for approval of a quality control manual.  
 296-150B-055 Changes to an approved design plan or quality control manual.  
 296-150B-060 Expiration of design plan approval.  
 296-150B-065 Trade secrets.  
 296-150B-070 Applications for HUD insignia for mobile homes.  
 296-150B-075 Applications for inspection and insignia for commercial coaches, recreational vehicles, and components.  
 296-150B-080 Applications for insignia for commercial coaches, recreational vehicles, and components.  
 296-150B-085 Inspections at a manufacturer's plant by a local enforcement agency, an independent inspection agency, or the manufacturer.  
 296-150B-090 Other inspections by the department.  
 296-150B-095 Action after inspection.  
 296-150B-100 Inspection of commercial coaches after installation at the building site.  
 296-150B-105 Complaint investigations.  
 296-150B-110 Fee required if a structure or component is not ready for inspection.  
 296-150B-115 Alterations.  
 296-150B-120 Application for alteration insignia and approval of alteration.  
 296-150B-122 Location of insignia.  
 296-150B-125 Identification of commercial coaches and recreational vehicles.  
 296-150B-130 Lost or damaged insignia.  
 296-150B-135 Notice of noncompliance.  
 296-150B-140 Prohibited sale or lease notice.  
 296-150B-145 Approval of equipment.  
 296-150B-150 Department approval of listing and testing agencies, licensed professional engineers, and licensed architects.  
 296-150B-155 Approval of alternates.  
 296-150B-160 Manufacturing in more than one location.  
 296-150B-165 Change of name or address.  
 296-150B-175 Change of ownership.  
 296-150B-180 Reciprocal agreements.  
 296-150B-185 Reciprocal agreement for recreational vehicles.  
 296-150B-200 General installation requirements for mobile homes.  
 296-150B-205 Installation permits.  
 296-150B-210 Inspections.  
 296-150B-215 Requirements of local jurisdictions.  
 296-150B-220 Inspection by local jurisdictions.  
 296-150B-225 Building site preparation.  
 296-150B-230 Foundation system footings.  
 296-150B-235 Foundation system piers.  
 296-150B-240 Foundation system plates and shims.  
 296-150B-245 Foundation facia.  
 296-150B-250 Anchoring systems.  
 296-150B-255 Assembly.  
 296-150B-300 Construction requirements for mobile homes.  
 296-150B-305 Standards for recreational vehicles.  
 296-150B-307 Standards for park trailers.  
 296-150B-310 Construction requirements for recreational vehicles—Power-supply assembly.  
 296-150B-315 Construction standards for recreational vehicles—Low voltage circuits.  
 296-150B-400 Definitions.  
 296-150B-403 Minimum requirements.  
 296-150B-407 Structural analysis.  
 296-150B-410 Standards for equipment and installations.  
 296-150B-413 Structural design—Requirements.  
 296-150B-417 New materials and methods.  
 296-150B-420 Design dead loads.  
 296-150B-423 Design live loads.  
 296-150B-427 Standard wind.  
 296-150B-430 Roof loads.  
 296-150B-433 Snow loads.  
 296-150B-437 Posting design loads.  
 296-150B-440 Design load deflection.  
 296-150B-443 Fastening of structural systems.  
 296-150B-447 Instructions.  
 296-150B-450 Walls.  
 296-150B-453 Drilling or notching of wood wall structural members.  
 296-150B-457 Firestopping.  
 296-150B-460 Interior walls and partitions.  
 296-150B-463 Floors.  
 296-150B-467 Drilling or notching of wood joist structural members.  
 296-150B-470 Roof trusses.  
 296-150B-473 Structural load test.  
 296-150B-477 Roof coverings.  
 296-150B-480 Flame-spread limitations and combustibility.  
 296-150B-483 Kitchen cabinet protection.  
 296-150B-487 Carpeting.  
 296-150B-490 Undervehicle closure material.  
 296-150B-497 Bathroom.  
 296-150B-500 Glass and glazed openings.  
 296-150B-503 Fire warning equipment—Automatic smoke detectors.  
 296-150B-507 Room and hallway sizes.  
 296-150B-508 Insulation standards.  
 296-150B-510 Handicap standards.  
 296-150B-513 Light and ventilation.  
 296-150B-515 Heating, cooling, and ventilation requirements for portable classrooms.  
 296-150B-517 Exit facilities.  
 296-150B-520 Weather resistance.  
 296-150B-523 Windstorm protection.  
 296-150B-527 Table—Ties required per side of single width commercial coach.  
 296-150B-530 Table—Accepted engineering practice standards.  
 296-150B-533 Table—Glazing in hazardous locations.  
 296-150B-537 Table—Minimum uniformly distributed live loads.  
 296-150B-540 Table—Concentrated live loads.  
 296-150B-543 Interior privacy.  
 296-150B-547 Interior passage.  
 296-150B-550 Electrical—General.  
 296-150B-553 Definitions.  
 296-150B-557 Low-voltage systems—Low-voltage circuits.  
 296-150B-560 Wiring materials—Combination electrical systems.  
 296-150B-563 Generator installations—Mounting.  
 296-150B-567 Branch circuit and feeder calculations.  
 296-150B-570 Disconnecting means and branch circuit protective equipment—General.  
 296-150B-573 Power supply—Feeder assembly equipment.  
 296-150B-577 Identification of feeder assembly connection.  
 296-150B-580 Wiring methods—Wiring of expandable or multiple units.  
 296-150B-583 Under-chassis wiring.  
 296-150B-587 Rodent resistance.  
 296-150B-590 Electrical equipment—Lighting fixtures.  
 296-150B-593 Equipment mounting.  
 296-150B-597 Outdoor outlets, fixtures, air cooling equipment, etc.  
 296-150B-600 Grounding—General.  
 296-150B-603 Switch and receptacle plates.  
 296-150B-607 Dielectric strength test.  
 296-150B-610 Mechanical—General.  
 296-150B-613 Mechanical—Definitions.  
 296-150B-617 LPG equipment and installations—Construction of containers.  
 296-150B-620 Location of LPG containers and systems.  
 296-150B-623 LPG container valves and accessories.  
 296-150B-627 LPG safety devices.  
 296-150B-630 LPG system enclosure and mounting.  
 296-150B-633 LPG system design and service line pressure.  
 296-150B-637 Electrical equipment.  
 296-150B-640 Gas piping systems—General.  
 296-150B-643 Piping design.  
 296-150B-647 Materials.  
 296-150B-650 Expandable or multiple commercial coaches.  
 296-150B-653 System sizing—Gas pipe sizing.  
 296-150B-657 Sizing and capacity of gas piping.  
 296-150B-660 Description of tables.  
 296-150B-663 Use of capacity tables.  
 296-150B-667 Table—Iron pipe and tubing sizes.  
 296-150B-670 Joints and installation—Joints for gas pipe.  
 296-150B-673 Joints in gas tubing systems.  
 296-150B-677 Concealed tubing.  
 296-150B-680 Pipe-joint compound.  
 296-150B-683 Concealed joints.  
 296-150B-687 Hangers and supports.

296-150B-690	Electrical ground.
296-150B-693	Identification of gas supply connections.
296-150B-697	Gas piping system openings.
296-150B-700	Appliance connections.
296-150B-703	Valves.
296-150B-707	Testing for leakage—Before appliances are connected.
296-150B-710	After appliances are connected.
296-150B-713	Rodent resistance.
296-150B-717	Oil piping systems—General.
296-150B-720	Oil piping systems—Expandable or multiple commercial coaches.
296-150B-723	Oil piping systems—Materials.
296-150B-727	Oil piping systems—Size of oil piping.
296-150B-730	Oil piping systems—Joints for oil piping.
296-150B-733	Oil piping systems—Tubing joints.
296-150B-737	Oil piping systems—Pipe-joint compound.
296-150B-740	Oil piping systems—Couplings.
296-150B-743	Oil piping systems—Grade of piping.
296-150B-747	Oil piping systems—Strap hangers.
296-150B-750	Oil piping systems—Testing for leakage.
296-150B-753	Appliances—Heat-producing.
296-150B-757	Appliances—Installation.
296-150B-760	Appliances—Venting, ventilation, and combustion air.
296-150B-763	Appliances—Clearance-general.
296-150B-767	Safety devices—Water heater relief valves.
296-150B-770	Air duct material for circulating air supply system.
296-150B-773	Sizing of air ducts.
296-150B-777	Airtightness of air supply duct systems.
296-150B-780	Air ducts—Expandable or multiple commercial coach connections.
296-150B-783	Air ducts—Return air systems.
296-150B-787	Air ducts—Joints and seams.
296-150B-790	Air ducts—Registers or grills.
296-150B-793	Air ducts—Duct and plenum insulation.
296-150B-797	Plumbing—Definitions.
296-150B-800	Plumbing—General.
296-150B-803	Plumbing—Location of water-supply connections.
296-150B-807	Plumbing—Tub and shower enclosures.
296-150B-810	Drainage—Location of drain outlets.
296-150B-813	Drainage—Cap or plug.
296-150B-817	Drainage—Clearance from drain outlet.
296-150B-820	Drainage—Drainage systems materials.
296-150B-950	Hearing on grievances.
296-150B-990	Fees.

**WAC 296-150B-005 Application and scope.** (1) This chapter implements the provisions of RCW 43.22-.340 through 43.22.445, which cover the construction and approval of mobile homes, commercial coaches, and recreational vehicles. The purpose of this chapter is to combine under one heading all applications, procedures, requirements, and codes relating to mobile homes, commercial coaches, and recreational vehicles. Many of the applications and procedures are the same for each kind of structure; occasionally, they will differ. These rules specify when a person must follow a procedure other than the general procedure.

(2) This chapter applies to:

(a) Mobile homes, commercial coaches, and recreational vehicles manufactured after 1 January 1968, other than mobile homes labeled by the Department of Housing and Urban Development (HUD) after 15 June 1976. HUD-labeled mobile homes are governed by the Federal Mobile Home Standards in 24 CFR Part 3280 and 24 CFR Part 3282 until they are sold or leased to a dealer, distributor, or consumer;

(b) Alterations to the plumbing, heating, or electrical systems, or to the body or frame of a mobile home not

labeled by HUD, commercial coach, or recreational vehicle, regardless of the date of manufacture;

(c) Alterations to the plumbing, heating, or electrical systems, or to the body or frame, of a HUD-labeled mobile home after the manufacturer has sold the mobile home to a dealer, distributor, or consumer;

(d) Components; and

(f) Equipment and installations intended to be used in mobile homes, commercial coaches, recreational vehicles, and components.

[Statutory Authority: RCW 43.22.340. 82-09-053 (Order 82-13), § 296-150B-005, filed 4/16/82.]

**WAC 296-150B-010 Enforcement.** The department administers and enforces the provisions of this chapter. Pursuant to approval by HUD, it also administers and enforces the Federal Mobile Home Law by acting as a production Inspection Primary Inspection Agency (IPIA) and as the State Administrative Agency (SAA).

An officer, agent, or employee of the department may enter any premises, during working hours or at other reasonable times, where structures or components are manufactured, sold, leased, or offered for sale or lease. He or she may examine a manufacturer's quality control and production records, and may inspect any construction, equipment, or installations to ensure that the manufacturer is complying with this chapter. If necessary to make a proper inspection, he or she may require a manufacturer, dealer, distributor, or consumer to remove part of the structure or component.

[Statutory Authority: RCW 43.22.340. 82-09-053 (Order 82-13), § 296-150B-010, filed 4/16/82.]

**WAC 296-150B-015 Definitions.** For the purposes of this chapter:

(1) "Alteration" means the replacement, addition, modification, or removal of any equipment or installations that affect the construction, structural members, fire safety, or occupancy classification, or the plumbing, heating, or electrical systems, of a structure or component.

The following are not alterations unless they are made to repair damage caused by fires, floods, or damage in transit or during installation.

(a) Repairs with approved parts;

(b) Modification of a listed fuel-burning appliance in accordance with the terms of its listing;

(c) Replacement of equipment with similar equipment; and

(d) Adjustment and maintenance of equipment.

(2) "Approved" means approved by the department.

(3) "Anchoring system" means a system of straps, cables, turnbuckles, bolts, fasteners, or other approved components that secures a mobile home to ground anchors or to other approved fastening devices.

(4) "Audit" means an inspection to examine for compliance a manufacturer's production and quality control procedures.

(5) "Building site" means a tract, parcel, or subdivision of land, including a mobile home park, on which a

structure other than a recreational vehicle is or will be installed.

- (6) "Component" means a discrete element that is:
- (a) Designed to be installed in a structure;
  - (b) Manufactured as a unit; and
  - (c) Designed for a particular function or group of functions. "Component" includes service cores.
- (7) "Consumer" means a person, firm, corporation, agency, or governmental body, other than a manufacturer or dealer, that buys or leases a structure for his, her, or its own use.
- (8) "Custom structure" means a one-of-a-kind structure.
- (9) "Dealer" means a person, company, or corporation authorized to engage in the business of leasing, selling, offering for sale or lease, buying, or trading structures.
- (10) "Department" means the department of labor and industries.
- (11) "Design option" means a design that a manufacturer may use as an option to its design plan.
- (12) "Design plan" means a plan for construction of a structure or component.
- (13) "Equipment" means all materials, appliances, devices, fixtures, fittings, or accessories used in the manufacture, assembly, installation, or alteration of structures and components.
- (14) "Footing" means the portion of a foundation system that transmits loads from a mobile home to the soil.
- (15) "Foundation facia" means the materials that enclose the entire perimeter of a mobile home and form a plane between the exterior wall of the mobile home and the ground.
- (16) "Foundation system" means the footings, piers, caps, and shims that support a mobile home.
- (17) "HUD" means the federal Department of Housing and Urban Development.
- (18) "Independent inspection agency" means an organization that is in the business of inspecting structures, components, or equipment.
- (19) "Insignia" means a label, stamp, or tag issued by the department to indicate that the structure or component bearing the insignia complies with this chapter or the HUD mobile home standards.
- (20) "Install" means to erect, construct, assemble, or set in place a structure, component, or piece of equipment at a building site or in another structure or building.
- (21) "Labeled" means bearing the department's insignia, HUD's insignia, or a label of approval from a testing or listing agency.
- (22) "Lease" means an oral or written contract for the use, possession, or occupancy of property. It includes rent.
- (23) "Listed" means that a piece of equipment, a component, or an installation appears in a list published by an approved testing or listing agency.
- (24) "Listing agency" means an organization that is in the business of approving equipment or installations.

(25) "Local enforcement agency" means a city or county agency that enforces laws or ordinances governing the construction and installation of structures and components.

(26) "Main frame" means the structural component on which the structure may be mounted.

(27) "Manufacturing" means making, fabricating, forming, or assembling a structure, service core, component, equipment, or installation.

(28) "Mobile home" means a "manufactured home" that is a structure, transportable in one or more sections, which in the traveling mode, is eight body feet or more in width or forty body feet or more in length, or, when erected on site, is three hundred twenty or more square feet, and which is built on a permanent chassis and designed to be used as a dwelling with or without a permanent foundation when connected to the required utilities, and includes the plumbing, heating, air-conditioning, and electrical systems contained therein. Calculations used to determine the number of square feet in a structure will be based on the structure's exterior dimensions measured at the largest horizontal projections when erected on site. These dimensions will include all expandable rooms, cabinets, and other projections containing interior space, but do not include bay windows. This term includes all structures which meet the above requirements except the size requirements and with respect to which the manufacturer voluntarily files a certification pursuant to §3282.13 and complies with the standards set forth in Part 3280 by HUD.

(29) "Ordinance" means the part of a code adopted by this chapter that prescribes an item other than a method of construction, such as room sizes, floor plans, lighting, ventilation, ceiling heights, and exits.

(30) "Pier" means the part of the mobile home foundation system between the footing and the floor frame or floor joist, excluding caps and shims.

(31) "Quality control" means the plan and method for ensuring that the manufacture, fabrication, assembly, or erection of structures, components, and installations, and the storing, handling, and use of materials, complies with this chapter.

(32) "Recreational vehicle" means a vehicular type unit primarily designed for recreational camping, travel, or seasonal use which has its own motive power or is mounted on or towed by another vehicle. The basic entities are: Travel trailer, folding camping trailer, park trailer, truck camper, motor home, and multi-use vehicles.

(33) "Structure" means a mobile home, commercial coach, or recreational vehicle that is entirely or substantially prefabricated or assembled at a factory or a place other than the building site on which the structure will be installed.

(34) "System" means a part of a structure or component that is designed to serve a particular function, such as a structural, plumbing, electrical, heating, or mechanical system.

(35) "Testing agency" means an organization that is in the business of testing equipment, installations, or systems.



(36) "Commercial coach" means a structure transportable in one or more sections that is built on permanent chassis and designed to be used for commercial purposes with or without a permanent foundation when connected to the required outlets and may include plumbing, heating, air conditioning, and electrical systems contained therein. A commercial coach shall not be used as a single family dwelling.

(37) "Park trailer" means a vehicular unit which meets the following criteria:

(a) Built on a single chassis, mounted on wheels.

(b) Designed to provide seasonal or temporary living quarters which may be connected to utilities necessary for operation of installed fixtures and appliances.

(c) A gross trailer area not exceeding four hundred square feet. In calculating the square footage of a home, measurements shall be taken on the exterior of the home. The square footage includes all siding, corner trim, and molding, storage space, and area enclosed by windows but not the roof overhang.

(d) Exceeds the size restrictions specified in ANSI 119.2.

(38) "Uniform standards" as used in RCW 43.22.440 means those set-up instructions provided by the manufacturer, or specified in this chapter under WAC 296-150B-225 through 296-150B-255. No other requirements may be imposed.

Exception: When extenuating conditions exist, not addressed in this chapter or the set-up instructions provided by the manufacturer, the local building official having jurisdiction shall be consulted.

[Statutory Authority: RCW 43.22.340 through 43.22.445. 89-05-016 (Order 88-31), § 296-150B-015, filed 2/9/89; 88-19-010 (Order 88-19), § 296-150B-015, filed 9/9/88; 86-21-136 (Order 86-32), § 296-150B-015, filed 10/22/86. Statutory Authority: RCW 43.22.340. 82-09-053 (Order 82-13), § 296-150B-015, filed 4/16/82.]

**WAC 296-150B-020 Insignia of approval--In general.** (1)(a) A manufacturer of a structure or component that is intended to be sold, leased, or used in Washington must obtain an insignia for each structure or component before it sells, leases, or allows the use of the structure or component.

(b) A person who has altered or intends to alter a structure must obtain a new insignia before it offers for sale, sells, or leases the structure.

(c) A person who brought a structure or component into Washington from another state must obtain an insignia before he or she uses, sells, or leases the structure or component, unless the structure or component has been used outside the state for at least six months.

(2) A manufacturer need not obtain an insignia for a component or structure, except for HUD mobile homes, if:

(a) The structure or component is manufactured in Washington but the manufacturer has designated it for delivery, and delivered it to, a purchaser in another state;

(b) the structure or component is delivered in Washington, but is purchased by a common carrier, shipped by the seller via the purchaser, carried under a

bill of lading, and the structure or component is transported to a destination in another state;

(c) the structure or component is delivered in Washington, but is purchased from a dealer or manufacturer in another state for use outside this state, and the purchaser transports the structure or component from Washington to a point outside Washington within 30 days of the date of delivery.

[Statutory Authority: RCW 43.22.340. 82-09-053 (Order 82-13), § 296-150B-020, filed 4/16/82.]

**WAC 296-150B-025 Application for approval of a design plan.** (1)(a) A manufacturer of a component or structure, except for HUD mobile homes, must obtain the department's approval of a design plan for the structure or component. The department will not grant an insignia unless the design plan is approved.

(2)(a) The application must include:

(i) A completed application form. The manufacturer may obtain a form from the department.

(ii) An application for approval of a quality control manual, if necessary. (See WAC 296-150B-050.)

(iii) One complete set of design plans, specifications, engineering data, and test results, plus one additional complete set for each location at which the manufacturer will manufacture the structure or component.

(iv) The filing fee and the minimum fee for examining the design plan (see WAC 296-150B-990).

(b) If a manufacturer is from out of state, the application must also include a statement from the manufacturer that it agrees to submit to the department annually the names and addresses of all Washington dealers and distributors for the manufacturer's product.

(3) A manufacturer of mobile homes, pursuant to HUD's rules, must have a Design Approval Primary Inspection Agency (DAPIA) check its design plan instead of applying for approval with the department.

[Statutory Authority: RCW 43.22.340. 82-09-053 (Order 82-13), § 296-150B-025, filed 4/16/82.]

**WAC 296-150B-030 Requirements for design plans.**

(1) General requirements. A design plan must include plan and elevation views of the structure or component, and the specifications, engineering data, and test results necessary for a complete evaluation of the design. A design plan for a recreational vehicle need not include an elevation view or structural data. A manufacturer may submit the specifications, engineering data, and test results separately from the drawings.

If the specifications, engineering data, and test reports are not included on the plan drawings, they must be fastened together. The cover sheet of the plan must note that the documents are part of the plan.

The plan and elevation views for the design plan must be drawn to scale on uniformly sized standard drawing sheets. The applicant must submit prints of the drawings; the department will not accept originals.

The applicant must provide, on the cover or face sheet of the design plan, information that describes the plan, including the plan designation, description of design options, sheet numbers, and titles. The cover sheet should

also have space for the department to insert the plan number and the approval date.

The plan must indicate where the manufacturer will affix the insignia to the structure or component. A plan that covers three or more modules must have a "key" drawing to show the arrangement of the modules.

(2) If a manufacturer is applying for approval of a design plan for a commercial coach, the manufacturer must designate the occupancy class of the commercial coach pursuant to the occupancy classifications given in the Uniform Building Code.

(3) Specific requirements. The department has numerous specific requirements for design plans. When an applicant asks for an application form for approval of its design plan, it should specify the kind of structure or component it intends to manufacture, and the kind of design plan it intends to submit. The department will send the applicant a copy of the specific requirements.

[Statutory Authority: RCW 43.22.340, 82-09-053 (Order 82-13), § 296-150B-030, filed 4/16/82.]

**WAC 296-150B-035 Engineering analysis and test procedures.** (1) A manufacturer must show that a structural design, method of construction, installation, or piece of equipment is adequate to fulfill its intended function, further the manufacturer must submit to the department information on and the results of an engineering analysis or a physical test.

(2) When the manufacturer does an engineering analysis of the design, method, installation, or equipment, the analysis must be made in accordance with generally established principles of engineering and must be signed by an architect or professional engineer licensed in Washington.

(3) When the manufacturer tests the design, method, installation, or equipment, the tests must be performed by a testing agency or must be directed, witnessed, and evaluated by an approved architect or professional engineer licensed in Washington.

Test reports must contain the following items:

- (a) A description of the method or standards that applied to the test;
- (b) A description and drawings of the item tested;
- (c) A description of the test set-up;
- (d) A description of the procedure used to load the item for, and to measure, each condition;
- (e) Test data (and graphs, where applicable), including pertinent observations of the characteristics and behavior of the item tested;
- (f) Engineering data; and
- (g) Analysis, comments, and conclusion.

(4) The results of the tests or analyses must be in writing and must identify the design plan to which the results relate.

[Statutory Authority: RCW 43.22.340 through 43.22.445, 87-21-040 (Order 87-20), § 296-150B-035, filed 10/14/87. Statutory Authority: RCW 43.22.340, 82-09-053 (Order 82-13), § 296-150B-035, filed 4/16/82.]

**WAC 296-150B-040 Department approval of the design plan.** (1) The department shall approve a design

(1989 Ed.)

plan if it complies with this chapter. If the department approves a design plan, it will return an approved copy of the plan to the applicant. The applicant must keep a copy of the approved plan at each location at which it is building the structure or component described by the design plan.

(2) If the design plan does not comply with this chapter, the department shall notify the applicant in writing of the deficiencies in the plan. The applicant may resubmit a corrected design plan pursuant to WAC 296-150B-045.

[Statutory Authority: RCW 43.22.340, 82-09-053 (Order 82-13), § 296-150B-040, filed 4/16/82.]

**WAC 296-150B-045 Resubmittal of corrected design plan.** An applicant who has been notified of deficiencies in its design plan may correct the plan and resubmit it within 90 days after it receives the notice. If the applicant does not meet this deadline, the department may treat the resubmittal as a new application for approval of the design plan.

Each resubmittal must include the minimum resubmittal fee set out in WAC 296-150B-990.

[Statutory Authority: RCW 43.22.340, 82-09-053 (Order 82-13), § 296-150B-045, filed 4/16/82.]

**WAC 296-150B-050 Application for approval of a quality control manual.** As a minimum the quality control manual/quality control program will provide for the following:

(1) Designation of officer/manager responsible for establishment and implementation of the quality control program.

(2) Design plan submission and approval.

(3) Drawing and change control that provides for the generation and distribution of working drawings, manufacturing processes and procedures, inspection and test procedures consistent with the design approvals and specification requirements.

(4) Receiving inspection of procured material in accordance with established acceptance criteria.

(5) Definition of production stations, the work performed in each station, type and amount of inspection and test performed, minimum acceptance criteria and person responsible.

(6) Description of documentation used to define the as-built configuration of each unit produced.

(7) Identification, control and disposition of nonconforming material.

(8) Corrective action system that will provide positive correction or repetitive discrepancies, failures, or nonconformance.

(9) Controls for material storage to include age-dated material.

(10) Calibration of all special tooling, gauges, and test equipment.

(11) Controls for issuance of Washington state insignias.

[Statutory Authority: RCW 43.22.340 through 43.22.445, 87-21-040 (Order 87-20), § 296-150B-050, filed 10/14/87. Statutory Authority:

RCW 43.22.340. 82-09-053 (Order 82-13), § 296-150B-050, filed 4/16/82.]

**WAC 296-150B-055 Changes to an approved design plan or quality control manual.** If a manufacturer wants to change its design plan or quality control manual, or a change is required because the department has amended the rules in this chapter, the manufacturer must apply for approval of the new design plan pursuant to WAC 296-150B-025, or the new quality control manual pursuant to WAC 296-150B-050.

If the manufacturer must change the design plan or quality control manual to comply with changes in this chapter, the manufacturer may continue to manufacture its product under the old design plan or quality control manual for 90 days after the changes in this chapter become effective. The manufacturer should submit its new design plan or quality control manual within 30 days after the change takes effect to ensure that the department will have time to examine and approve the plan or manual.

[Statutory Authority: RCW 43.22.340. 82-09-053 (Order 82-13), § 296-150B-055, filed 4/16/82.]

**WAC 296-150B-060 Expiration of design plan approval.** (1) Approval of a design plan and quality control manual expires twelve months after the date the department approves the plan.

(2) A manufacturer must apply to the department for renewal of the design plan and quality control manual approval at least two months before the approval expires to ensure that the department will have time to examine and approve the application. The manufacturer may obtain an application for renewal of plan and quality control manual approval from the department. The manufacturer must submit:

- (a) A completed application form; and
- (b) The renewal fee required by WAC 296-150B-990. The renewed plan and quality control manual must be identical to the original design plan, except that the manufacturer may change the model name or designation.

(3) If a manufacturer allows a design plan and quality control manual approval to expire, it must return all unused insignia issued to the manufacturer for the product covered by the expired design plan.

[Statutory Authority: RCW 43.22.340 through 43.22.445. 87-21-040 (Order 87-20), § 296-150B-060, filed 10/14/87. Statutory Authority: RCW 43.22.340. 82-09-053 (Order 82-13), § 296-150B-060, filed 4/16/82.]

**WAC 296-150B-065 Trade secrets.** The department will keep confidential all material, design plans, specifications, engineering data, test results, quality control manuals, and other design information that a manufacturer submits to the department. The department will release this information to public scrutiny only if ordered to do so by a court.

[Statutory Authority: RCW 43.22.340. 82-09-053 (Order 82-13), § 296-150B-065, filed 4/16/82.]

[Title 296 WAC—p 1868]

**WAC 296-150B-070 Applications for HUD insignia for mobile homes.** A manufacturer of mobile homes may apply to the department for HUD insignias for its mobile homes. The manufacturer may obtain an application for insignia from the department. The manufacturer must submit with the application a fee for the insignias. Upon receipt of the application and the fee, the department will send the insignias to the manufacturer. The manufacturer must notify the department immediately of any changes in the information it provided under this section.

[Statutory Authority: RCW 43.22.340. 82-09-053 (Order 82-13), § 296-150B-070, filed 4/16/82.]

**WAC 296-150B-075 Applications for inspection and insignia for commercial coaches, recreational vehicles, and components.** (1) Inspections in general. A manufacturer of commercial coaches, recreational vehicles, or components must apply to the department for inspections of its products. The department will not issue an insignia for a unit until it has completed inspecting the unit.

The manufacturer may obtain an inspection application form from the department. It must submit the form and an application fee. The department must receive the application at least five days before the proposed date of inspection.

A manufacturer need not apply to the department for inspection if the department has approved an independent inspection agency, a local enforcement agency, or the manufacturer itself to inspect its products. See WAC 296-150B-085.

Each unit of the manufacturer's product must have a specific serial number to ensure that the department has inspected each unit. The manufacturer must have the approved design plan and, if applicable, the approved quality control manual at the location at which it is manufacturing the product. A manufacturer with a quality control manual must provide a control card or other quality control document for each unit.

(2) The department shall generally inspect each commercial coach and component twice. The department shall make an "ok to cover" inspection of a unit before the electrical, plumbing, mechanical, heating, and structural systems are covered or sealed during the construction. After the unit is completed, the department shall make a "final" inspection.

If a commercial coach is built to a simple design, the department may choose to make only a final inspection of the commercial coach.

(3) The department may inspect a recreational vehicle either before or after it has been completed.

[Statutory Authority: RCW 43.22.340. 82-09-053 (Order 82-13), § 296-150B-075, filed 4/16/82.]

**WAC 296-150B-080 Applications for insignia for commercial coaches, recreational vehicles, and components.** The manufacturer of a commercial coach, recreational vehicle, or component must apply to the

department for an insignia for each unit. The manufacturer may obtain an application form from the department. The manufacturer must submit with the application a fee for each insignia. The department will give an insignia to a manufacturer for installation on a unit if it has received the application and fees, and if the final inspection reveals that the unit complies with this chapter.

[Statutory Authority: RCW 43.22.340. 82-09-053 (Order 82-13), § 296-150B-080, filed 4/16/82.]

**WAC 296-150B-085 Inspections at a manufacturer's plant by a local enforcement agency, an independent inspection agency, or the manufacturer.** (1) This section applies to manufacturers of components and factory-built structures.

(2) A manufacturer who wants to be inspected by a local enforcement agency or an independent inspection agency may ask the agency to inspect it. The local enforcement agency or independent inspection agency may do so if it obtains approval from the department.

If the department approves of the agency, it shall by contract allow the agency to perform the inspections. The contract shall require the agency to comply with and enforce the requirements of this chapter, and shall list all manufacturers that the agency may inspect. The parties may amend the contract at any time to add or delete a manufacturer. The manufacturer may obtain the departmental insignia from the agency instead of the department.

(3) A manufacturer may contract with the department to inspect its own products. The contract shall require the manufacturer to comply with and enforce the requirements of this chapter and the manufacturer's quality control manuals. The contract shall specify the management procedures by which the manufacturer will assure that the inspections are carried out, and shall designate the officer, partner, or owner who is responsible for the inspections.

(4) The department shall audit the agency's or manufacturer's inspections to ensure they are complying with the contract and this chapter. If the agency or manufacturer is not complying with the contract or this chapter, the department may require the agency or manufacturer to allow the department to perform the inspections.

[Statutory Authority: RCW 43.22.340. 82-09-053 (Order 82-13), § 296-150B-085, filed 4/16/82.]

**WAC 296-150B-090 Other inspections by the department.** (1) A person must ask the department to inspect a structure or component if:

(a) The person is selling, leasing, or offering for sale or lease a structure or component that does not bear an insignia and is required to bear an insignia;

(b) The person is altering or has altered the structure or component; and

(c) The department has issued a correction notice and a reinspection is necessary.

(2) An applicant for an inspection must submit an application on forms supplied by the department at least five working days before the desired date of inspection.

(1989 Ed.)

The applicant must submit with the application an application fee pursuant to WAC 296-150B-990.

(3) For any inspection, the applicant must provide to the department the design plans, specifications, engineering data, and test results on request.

[Statutory Authority: RCW 43.22.340. 82-09-053 (Order 82-13), § 296-150B-090, filed 4/16/82.]

**WAC 296-150B-095 Action after inspection.** After an inspection, if the structure or component meets the requirements of this chapter, and the applicant submits completed insignia application forms, insignia fees, and inspection fees, the department shall issue an insignia for the structure or component.

[Statutory Authority: RCW 43.22.340. 82-09-053 (Order 82-13), § 296-150B-095, filed 4/16/82.]

**WAC 296-150B-100 Inspection of commercial coaches after installation at the building site.** (1) A manufacturer, dealer, or owner must obtain the approval of the local enforcement agency for each installation of a commercial coach at a building site. After the department performs a final inspection of a unit, it may send a notice to the local enforcement agency that specifies what connections, standards, and items the agency should check when the unit is installed.

(2) The local enforcement agency may require the manufacturer to provide a set of design plans and specifications for the unit, and to obtain all necessary permits, before it allows the manufacturer to transport the unit to the building site.

(3) The local enforcement agency may not open for inspection any commercial coach or component that bears the department's insignia.

(4) The local enforcement agency shall notify the department if a unit has been damaged en route to the building site, or during installation, so that the department can inspect the damage to the unit.

[Statutory Authority: RCW 43.22.340. 82-09-053 (Order 82-13), § 296-150B-100, filed 4/16/82.]

**WAC 296-150B-105 Complaint investigations.** A person may complain in writing to the department about a structure or component. The complaint should describe the items that the person feels do not comply with this chapter. The department will send a copy of the complaint to the manufacturer and the dealer. The manufacturer and dealer have 30 days to respond. The department shall base its actions on the response.

If the department decides an investigation is necessary and discovers that the unit inspected violates this chapter, the manufacturer or dealer shall pay the cost of the inspection. If the department does not discover any violations, the complainant must pay the fees.

[Statutory Authority: RCW 43.22.340. 82-09-053 (Order 82-13), § 296-150B-105, filed 4/16/82.]

**WAC 296-150B-110 Fee required if a structure or component is not ready for inspection.** If a manufacturer or person applies to the department for an inspection of

[Title 296 WAC—p 1869]

a structure or component, and the structure or component is not ready to be inspected at the time or place specified in the application, the manufacturer or person must pay the department the application fee and any travel and per diem expenses.

[Statutory Authority: RCW 43.22.340, 82-09-053 (Order 82-13), § 296-150B-110, filed 4/16/82.]

**WAC 296-150B-115 Alterations.** (1) No person may alter a mobile home, commercial coach, or recreational vehicle unless the person has first applied for and obtained the department's approval of the alteration. "Alteration" is defined in WAC 296-150B-015(1).

(2) If a person alters a structure in violation of subsection 1, the insignia affixed to the structure is void and may be confiscated by the department.

[Statutory Authority: RCW 43.22.340, 82-09-053 (Order 82-13), § 296-150B-115, filed 4/16/82.]

**WAC 296-150B-120 Application for alteration insignia and approval of alteration.** (1) If a person proposes to alter a structure, the person must file an application for an alteration insignia and an alteration fee with the department. The person may obtain an application form from the department.

(2) As a condition to approval of an alteration, the department may require inspections of the structure during the alteration to ensure that the alteration complies with this chapter. If the department indicates that inspections are required, the person altering the structure must apply for inspections pursuant to WAC 296-150B-090.

After the final inspection of the alteration, if the alteration complies with this chapter and the applicant has paid the inspection and insignia fees, the department shall issue an insignia for the altered structure.

[Statutory Authority: RCW 43.22.340, 82-09-053 (Order 82-13), § 296-150B-120, filed 4/16/82.]

**WAC 296-150B-122 Location of insignia.** Each insignia affixed to a recreational vehicle or commercial coach shall be located adjacent to the main entry door not less than twelve inches above the floor line.

[Statutory Authority: RCW 43.22.340 through 43.22.445, 87-21-040 (Order 87-20), § 296-150B-122, filed 10/14/87.]

**WAC 296-150B-125 Identification of commercial coaches and recreational vehicles.** (1) Each commercial coach or recreational vehicle manufactured, sold, leased, or offered for sale or lease in Washington shall bear a permanently affixed identification label that contains the following information:

- (a) The name of the manufacturer;
- (b) The month and year of manufacture;
- (c) The vehicle identification number;
- (d) The manufacturer's assigned identification number; and
- (e) Where applicable, the assigned plan approval number.

(2) The identification label shall be permanently attached either on the forward half of the left side of the

exterior wall of the commercial coach or recreational vehicle, not less than six inches above the floor line, or in proximity to the insignia.

[Statutory Authority: RCW 43.22.340 through 43.22.445, 87-21-040 (Order 87-20), § 296-150B-125, filed 10/14/87. Statutory Authority: RCW 43.22.340, 82-09-053 (Order 82-13), § 296-150B-125, filed 4/16/82.]

**WAC 296-150B-130 Lost or damaged insignia.** If an insignia is lost or damaged after it is affixed to a structure or component, the manufacturer, owner, or user must notify the department in writing immediately. The manufacturer or owner must specify the manufacturer, the vehicle identification number or serial number of the structure, and the insignia number if possible. The manufacturer, owner, or user must also return a damaged insignia if possible.

The department shall replace a damaged or lost insignia on payment of the insignia replacement fee pursuant to WAC 296-150B-990.

[Statutory Authority: RCW 43.22.340, 82-09-053 (Order 82-13), § 296-150B-130, filed 4/16/82.]

**WAC 296-150B-135 Notice of noncompliance.** If an inspection or investigation reveals that a structure or component violates this chapter, the department shall give or mail a notice of violations to the owner, dealer, manufacturer, or other person responsible for the violation. The notice of violation shall describe how the structure or component violates this chapter.

A person who receives a notice of violations must, within ten days after receipt, notify the department in writing of the action he or she has taken or will take to correct the violation. If the person has not corrected the violation within ten days after receipt of the notice, or within any other period of time allowed by the department, the department may confiscate the insignia assigned to the structure or component.

No person who has received a notice of violations may move, cause to be moved, or allow another person to move the structure or component to which the notice refers until the violations have been corrected, the corrections have been inspected and approved by the department, and the person has paid the appropriate inspection and insignia fees.

[Statutory Authority: RCW 43.22.340, 82-09-053 (Order 82-13), § 296-150B-135, filed 4/16/82.]

**WAC 296-150B-140 Prohibited sale or lease notice.** If an inspection or investigation reveals that a structure violates this chapter, the department may post the structure with a prohibited sale or lease notice. No person may sell or lease a structure that is posted with a prohibited sale or lease notice. No person may remove, cause to be removed, or allow to be removed a prohibited sale or lease notice until the violations have been corrected, the corrections have been inspected and approved by the department, and the person has paid the appropriate inspection and insignia fees.

The department may also prohibit the occupancy or use of a structure if it is not occupied or used at the time the violation is discovered.

[Statutory Authority: RCW 43.22.340. 82-09-053 (Order 82-13), § 296-150B-140, filed 4/16/82.]

**WAC 296-150B-145 Approval of equipment.** Equipment used in the body and frame, or the fire safety, plumbing, heating, mechanical, and electrical systems of structures and components must comply with this chapter and must be approved by the department. The department may approve equipment that is listed or labeled by an approved testing or listing agency. The department may approve equipment that is not listed or labeled if it determines that the equipment is adequate to protect health and safety.

The department may refuse to approve equipment that is listed or labeled if it determines that the equipment is not adequate to protect health and safety.

[Statutory Authority: RCW 43.22.340. 82-09-053 (Order 82-13), § 296-150B-145, filed 4/16/82.]

**WAC 296-150B-150 Department approval of listing and testing agencies, licensed professional engineers, and licensed architects.** (1) The department will consider the following information in determining whether to approve a listing or testing agency, professional engineer, or licensed architect:

- (a) The names of agents or officers;
- (b) The location of offices;
- (c) A description of services the agency, engineer, or architect furnishes or proposes to furnish;
- (d) A description of the employees' qualifications and responsibilities;
- (e) A summary of the agency's, engineer's, or architect's experience;
- (f) A description of the procedures and facilities the agency, engineer, or architect will use to evaluate a product, inspect the product manufacturer's operations and quality control, and label the units of a product;
- (g) A description of the specific information the agency, engineer, or architect will furnish with its listings;
- (h) A description of how the agency, engineer, or architect will deal with errors in its procedures that result in defective or unacceptable products;
- (i) Proof of independence and absence of conflict of interest; and
- (j) A published directory that includes a list of product manufacturers and product information.

(2) To obtain departmental approval, a listing or testing agency, professional engineer, or licensed architect may not be under the control of a manufacturer, dealer, or supplier for the structures, components, equipment, or installations that it approves or lists.

A listing or testing agency must publish at least annually a list of the equipment, components, or installations it has approved. The listing must certify that the equipment, components, and installations have been tested and meet nationally approved standards and must

specify the permissible uses for the equipment, components, and installations.

A listing agency must periodically inspect the manufacture of equipment, components, and installations that it has approved. A testing agency must test at least annually the equipment, components, and installations it has approved.

[Statutory Authority: RCW 43.22.340. 82-09-053 (Order 82-13), § 296-150B-150, filed 4/16/82.]

**WAC 296-150B-155 Approval of alternates.** The department may approve the use of an alternative design, material, appliance, system, device, arrangement, or method of construction if this chapter does not specifically proscribe the use of the alternative, and the alternative equals or betters the quality, strength, effectiveness, fire resistance, durability, and safety of the design, material, appliance, system, device, arrangement, or method of construction required by this chapter.

[Statutory Authority: RCW 43.22.340. 82-09-053 (Order 82-13), § 296-150B-155, filed 4/16/82.]

**WAC 296-150B-160 Manufacturing in more than one location.** A manufacturer that is manufacturing its product at more than one location must notify the department in writing of each location. A manufacturer of structures must keep an approved design plan and an approved quality control manual at each location.

[Statutory Authority: RCW 43.22.340. 82-09-053 (Order 82-13), § 296-150B-160, filed 4/16/82.]

**WAC 296-150B-165 Change of name or address.** If a manufacturer changes its name or address, it must notify the department in writing of the change within ten days. The notice must be accompanied with the appropriate fee.

[Statutory Authority: RCW 43.22.340. 82-09-053 (Order 82-13), § 296-150B-165, filed 4/16/82.]

**WAC 296-150B-175 Change of ownership.** If a manufacturer changes ownership, the new owner must notify the department in writing within ten days. The notice must be accompanied with the appropriate fee. The new owner need not submit a new application for design plan approval if it continues to manufacture the product in accordance with previously approved design plans.

[Statutory Authority: RCW 43.22.340. 82-09-053 (Order 82-13), § 296-150B-175, filed 4/16/82.]

**WAC 296-150B-180 Reciprocal agreements.** In accordance with RCW 43.22.400, the director has examined the statutes and rules of several states and finds that the statutes and rules provide construction standards that are equal to those of Washington, and that the states enforce their statutes and rules. The department has entered into reciprocal agreements with those states. The department has all reciprocal agreements on file at the factory-assembled structures section. The public may inspect and copy the agreements during regular business hours.



[Statutory Authority: RCW 43.22.340, 82-09-053 (Order 82-13), § 296-150B-180, filed 4/16/82.]

**WAC 296-150B-185 Reciprocal agreement for recreational vehicles.** Monitoring of reciprocal states, third party agencies, or manufacturers attaining self inspection status. The department shall, on a periodic basis, monitor the quality of the inspections performed by states, third party agencies, or manufacturers having self inspection status at the manufacturing facility to assure compliance with the requirements of the approved design plans, quality control manual, and respective specifications. Noncompliances determined during monitoring will be processed in accordance with WAC 296-150B-135.

[Statutory Authority: RCW 43.22.340 through 43.22.445, 87-21-040 (Order 87-20), § 296-150B-185, filed 10/14/87. Statutory Authority: RCW 43.22.340 and 43.22.400, 83-12-014 (Order 83-13), § 296-150B-185, filed 5/24/83.]

**WAC 296-150B-200 General installation requirements for mobile homes.** (1) All mobile homes shall be installed in compliance with the national manufactured housing procedural and enforcement regulations in subparts F and I of 24 C.F.R. Part 3282 adopted as of April 1, 1982, which are incorporated into these rules by this reference.

(2) A HUD-labeled mobile home shall also be installed in compliance with the mobile home manufacturer's installation instructions. The instructions must be approved by HUD. The manufacturer shall send two copies of its approved installation instructions to the purchaser of the mobile home. The copies shall be in the home and available at the time of inspection.

A mobile home not labeled by HUD shall also be installed in accordance with installation instructions provided by a professional engineer or architect licensed in Washington.

(3) To the extent that the installation of a mobile home is not covered by a manufacturer's, engineer's, or architect's instructions, the mobile home shall comply with the installation requirements set out in WAC 296-150B-225 through 296-150B-255.

(4) No person, firm, partnership, corporation, or other entity may install a mobile home unless he, she, or it owns the mobile home, is a licensed mobile home dealer, or is a contractor registered under chapter 18.27 RCW.

(5) In those areas that are (a) recognized as flood plains by the Washington state department of ecology or the Federal Emergency Management Agency, or (b) hazardous because of the probability of earthquakes, ground slides, avalanches, or high winds, the local jurisdictions may set requirements that are necessary to lessen the hazards.

[Statutory Authority: RCW 43.22.340 through 43.22.445, 87-21-040 (Order 87-20), § 296-150B-200, filed 10/14/87. Statutory Authority: RCW 43.22.350 and 43.22.440, 83-01-018 (Order 82-37), § 296-150B-200, filed 12/6/82. Statutory Authority: RCW 43.22.440, 82-09-059 (Order 82-12), § 296-150B-200, filed 4/19/82.]

**WAC 296-150B-205 Installation permits.** The owner or the installer of a mobile home must obtain an installation permit from the local enforcement agency

[Title 296 WAC—p 1872]

before it installs a mobile home that will be used as a residence on a building site. The applicant shall include with the application for the permit the permit fee set by the local enforcement agency. A dealer may not deliver a mobile home until it has verified that the owner or the installer has obtained an installation permit for the mobile home.

[Statutory Authority: RCW 43.22.350 and 43.22.440, 83-01-018 (Order 82-37), § 296-150B-205, filed 12/6/82. Statutory Authority: RCW 43.22.440, 82-09-059 (Order 82-12), § 296-150B-205, filed 4/19/82.]

**WAC 296-150B-210 Inspections.** (1) The installer shall request an inspection after all aspects of the installation, other than installation of the foundation facia, have been completed. The local enforcement agency will, if it accepts responsibility for inspections under WAC 296-150B-220, inspect the installation within five business days after it receives the request. If the inspection is not completed within five business days, the tenant or owner may occupy the mobile home at his or her own risk. Occupancy before inspection does not imply approval.

(2) The local enforcement agency shall approve the installation of a mobile home, and allow the mobile home to be occupied if the installation complies with the installation requirements of this chapter and the conditions of the installation permit.

(3) If the installation does not comply with the installation requirements of this chapter and the conditions of the installation permit, the local enforcement agency shall provide the installer with a list of corrections that the installer must make. The list of corrections shall state a date by which the corrections must be completed. The local enforcement agency shall reinspect the installation after the corrections are completed. If the items that require correction do not endanger the health or safety of the occupants, or substantially affect the habitability of the mobile home, the local enforcement agency may permit the owner of the mobile home to occupy it.

[Statutory Authority: RCW 43.22.350 and 43.22.440, 83-01-018 (Order 82-37), § 296-150B-210, filed 12/6/82. Statutory Authority: RCW 43.22.440, 82-09-059 (Order 82-12), § 296-150B-210, filed 4/19/82.]

**WAC 296-150B-215 Requirements of local jurisdictions.** Local jurisdictions may enforce their regulations that govern the installation of mobile homes if the regulations do not conflict with the installation requirements of this chapter.

[Statutory Authority: RCW 43.22.440, 82-09-059 (Order 82-12), § 296-150B-215, filed 4/19/82.]

**WAC 296-150B-220 Inspection by local jurisdictions.** (1) RCW 43.22.440. The legislature finds that inspections of mobile home installation are not done on a consistent basis. Mobile homes provide housing for many people in the state, and improperly installed mobile homes are a serious health and safety risk. Where possible and practical, mobile homes should be treated the same as any housing inhabited or to be inhabited by



persons in this state, including housing built according to the state building code.

(2) In consultation with the factory assembled structures advisory board for mobile homes, the director of labor and industries shall by rule establish uniform standards for the performance and workmanship of installation service and warranty service by persons or entities engaged in performing the services within this state for all mobile homes, as defined in RCW 46.04.302. The standards shall conform, where applicable, with statutes, rules, and recommendations established under the Federal National Mobile Home Construction and Safety Standards Act of 1974 (42 U.S.C. Sec. 5401 et seq.). These rules regarding the installation of mobile homes shall be enforced and fees charged by the counties and cities in the same manner the state building code is enforced under RCW 19.27.050.

If a dispute concerning an installation requirement of this chapter arises between any person or business and a local jurisdiction or other agent of the department, the dispute may be submitted to the factory assembled structures advisory board for its opinion as to the proper interpretation of the requirement.

(3) In addition to and in conjunction with the remedies provided in this chapter, failure to remedy any breach of the standards and rules so established, upon adequate notice and within a reasonable time, is a violation of the Consumer Protection Act, chapter 19.86 RCW and subject to the remedies provided in that chapter.

(4) A manufacturer's set-up manual shall be provided for the inspecting jurisdiction. The set-up manual shall be located between the I beam and the bottom board within five feet of the main electrical feeder when the skirting has not been installed. When the skirting has been installed, the set-up manual shall be located between the I beam and the bottom board within five feet of the access opening. Instructions shall be returned to such location when inspection is completed.

[Statutory Authority: RCW 43.22.340 through 43.22.445. 88-19-010 (Order 88-19), § 296-150B-220, filed 9/9/88. Statutory Authority: RCW 43.22.350 and 43.22.440. 83-01-018 (Order 82-37), § 296-150B-220, filed 12/6/82. Statutory Authority: RCW 43.22.440. 82-09-059 (Order 82-12), § 296-150B-220, filed 4/19/82.]

**WAC 296-150B-225 Building site preparation.** (1) A mobile home may not be installed at a building site unless the ground at the site has adequate compaction and load-bearing ability to meet the support requirements of Chapter 29 and Table 29B of the Uniform Building Code as adopted by the state building code council or WAC 296-150B-230. The installer or, if the building site is in a mobile home park, the park owner must ensure that the ground on which a mobile home is to be installed has been improved as necessary to provide a proper base for the mobile home and that the area beneath the mobile home has adequate drainage.

(2) Ground cover. A ground cover of 4 mil (0.004 inch thick) polyethylene or approved equal shall be laid over the ground within crawl spaces. The ground cover shall be overlapped twelve inches minimum at joints and shall extend over the top of the footing.

Exception: The ground cover may be omitted in unheated crawl spaces, if the crawl space has a concrete slab floor with a minimum thickness of three and one-half inches.

[Statutory Authority: RCW 43.22.340 through 43.22.445. 88-19-010 (Order 88-19), § 296-150B-225, filed 9/9/88. Statutory Authority: RCW 43.22.350 and 43.22.440. 83-01-018 (Order 82-37), § 296-150B-225, filed 12/6/82. Statutory Authority: RCW 43.22.440. 82-09-059 (Order 82-12), § 296-150B-225, filed 4/19/82.]

**WAC 296-150B-230 Foundation system footings.**

(1) Footings shall be constructed of:

(a) Solid concrete or an approved alternate that is at least 3 1/2 inches thick by 16 inches square; or

(b) Two 8-inch by 16-inch by 4-inch solid concrete blocks that are laid with their joint parallel to the main frame longitudinal member.

(2) Footings shall be:

(a) Evenly bedded and leveled;

(b) Placed on firm, undisturbed, or compacted soil that is free of organic material;

(c) Centered in a line directly under the main frame longitudinal members on both sides of a mobile home; and

(d) Spaced not more than 8 feet apart, and not more than 2 feet from the ends of the main frame. A closer spacing may be required, depending on the load-bearing capacity of the soil.

(3) A mobile home with more than one section must have center line blocking at end walls and at any other point of connection of the sections of the mobile home that are a ridgebeam bearing support. Blocking is also required at both ends of a door opening that is 6 feet or more wide in an exterior wall.

(4) If a mobile home requires footings on its exterior perimeter, the footings shall be installed below the frost line. Footings for the main frame longitudinal members must be recessed only if frost heave is likely to occur.

(5) Footings shall be constructed so that seventy-five percent of the area under the mobile home has at least 18 inches clearance between the bottom of the main chassis members and the ground level. The area beneath furnace cross-overs and fireplaces, however, must always have at least 18 inches clearance. At no point under the mobile home may clearance be less than 12 inches.

[Statutory Authority: RCW 43.22.350 and 43.22.440. 83-01-018 (Order 82-37), § 296-150B-230, filed 12/6/82. Statutory Authority: RCW 43.22.440. 82-09-059 (Order 82-12), § 296-150B-230, filed 4/19/82.]

**WAC 296-150B-235 Foundation system piers.** An installer must build and position piers and load-bearing supports or devices to distribute the required loads evenly. An installer may use manufactured piers or load-bearing supports or devices that are listed or approved for the intended use, or may build piers that comply with the following requirements. All blocks must be concrete blocks.

(1) A pier may be made of a single stack of 8-inch by 8-inch by 16-inch blocks if the blocks are not stacked more than three blocks high. A pier made of a single

stack of blocks shall be installed at a right angle to the main frame longitudinal member and shall be capped with no more than two 2-inch by 8-inch by 16-inch wood blocks or one 4-inch by 8-inch by 16-inch concrete block.

(2) A pier may be made of a double stack of 8-inch by 8-inch by 16-inch blocks if the blocks are not stacked more than 5 blocks high. Each row of blocks in such a pier shall be stacked at right angles to the abutting rows of blocks. A wood block must be of hem-fir, douglas fir, or spruce pine fir. The pier shall be capped with two 2-inch by 8-inch by 16-inch wood or concrete blocks. The pier shall be installed so that the joint between the cap blocks is at right angles to the main frame longitudinal member.

(3) A pier may be made with more than five rows of blocks if the stacked blocks are filled with 2000 psi concrete or mortar. A licensed architect or professional engineer must approve a foundation system that includes a pier that is higher than 72 inches (9 blocks) high, or in which more than 20 percent of the piers exceed 40 inches (5 blocks) high.

(4) All blocks shall be set with the cores placed vertically.

[Statutory Authority: RCW 43.22.350 and 43.22.440. 83-01-018 (Order 82-37), § 296-150B-235, filed 12/6/82. Statutory Authority: RCW 43.22.440. 82-09-059 (Order 82-12), § 296-150B-235, filed 4/19/82.]

**WAC 296-150B-240 Foundation system plates and shims.** An installer may fill a gap between the top of a pier and the main frame with a wood plate that is not more than 2 inches thick and two opposing wedge-shaped shims that are not more than 2 inches thick. Wood plates and shims must be of hem-fir, douglas fir, or spruce pine fir. A shim shall be at least 4 inches wide and 6 inches long. The installer shall fit the shim properly and drive it tight between the wood plate or pier and the main frame to ensure that the mobile home is level and properly supported at all load-bearing points. A block that abuts a wedge-shaped shim shall be solid.

[Statutory Authority: RCW 43.22.440. 82-09-059 (Order 82-12), § 296-150B-240, filed 4/19/82.]

**WAC 296-150B-245 Foundation facia.** (1) A mobile home shall have an approved foundation facia around its entire perimeter. The wood of the facia shall be at least three inches from the ground unless it is pressure-treated wood. Metal fasteners shall be galvanized, stainless steel, or other corrosion-resistant material. Ferrous metal members in contact with the earth, other than those that are galvanized or stainless steel, shall be coated with an asphaltic emulsion.

(2) The skirting of a manufactured home shall be ventilated by an approved mechanical means, or by openings in exterior facia or foundation walls. Such openings shall have a net area of not less than one square foot for each one hundred fifty square feet of under floor area. Openings shall be located as close to corners as practical and shall provide cross ventilation.

The required area of such openings shall be approximately equally distributed along the length of at least two opposite sides. They shall be covered with corrosion-resistant wire mesh with openings of one-quarter inch in dimension.

(3) Dryer vents and hot water tank pressure relief valves shall exhaust on the exterior of the foundation facia. The facia for each section of a mobile home shall have an opening of at least eighteen inches by twenty-four inches, with a cover of metal or pressure treated wood, to allow access to the crawl space. The foundation facia must be installed within thirty days after the mobile home is occupied.

[Statutory Authority: RCW 43.22.340 through 43.22.445. 88-19-010 (Order 88-19), § 296-150B-245, filed 9/9/88. Statutory Authority: RCW 43.22.350 and 43.22.440. 83-01-018 (Order 82-37), § 296-150B-245, filed 12/6/82. Statutory Authority: RCW 43.22.440. 82-09-059 (Order 82-12), § 296-150B-245, filed 4/19/82.]

**WAC 296-150B-250 Anchoring systems.** A local jurisdiction may require a single-section or multiple-section mobile home to have an anchoring system. Such an anchoring system may be less than or equal to the following requirements.

(1) Components of the anchoring system shall have a resistance to weather deterioration that is at least equivalent to that of a zinc coating that is not less than 0.3 ounces per square foot of coated surface. Cut edges of zinc-coated strapping do not need to be coated.

(2) An installer shall install, preload, and adjust a ground anchor in accordance with the anchor manufacturer's instructions. The installer must supply a copy of the instructions to the department or the local enforcement agency, as appropriate. A ground anchor, when installed, must be able to resist a working load of 3,150 pounds in the direction of the tie plus a 50 percent overload (4,725 pounds total) without failure. Failure occurs if the point of connection of a vertical tie to an anchor is withdrawn more than 2 inches at 3,150 pounds, or when the point of connection of a diagonal tie is moved more than 4 inches horizontally when a load of 3,150 pounds is applied at 45 degrees from the horizontal. Ground anchors shall be marked with the manufacturer's identification and model number in a location that is visible after the anchor is installed. The manufacturer of a ground anchor must provide instructions with each anchor that specify the kinds of soil for which the anchor is suitable.

(3) If concrete slabs or continuous footings are used to transfer the anchoring loads to the ground, the following requirements apply:

(a) Steel rods cast in concrete shall be able to resist the loads and corrosion as specified for ground anchors.

(b) A deadman anchor may be used in place of a listed anchor. It shall be constructed of solid concrete at least 6 inches in diameter and 2 feet long; reinforced with two #4 deformed steel rods; and installed at least 5 feet below the surface of the ground.

(c) A concrete slab may be used in place of a ground anchor if it provides holding strength equal to that required for ground anchors.

(4) Ties shall be of cable, strapping, or other approved materials. Ties shall be fastened to ground anchors and drawn tight with turnbuckles, yoke fasteners, or other approved tensioning devices.

Tension devices shall end in clevis, forged, or welded eyes. Hook ends are not permitted. Tension devices shall be designed to prevent self-disconnection if the tie becomes slack. Cable tie eyes shall be secured with two U-bolt cable clamps or an approved equivalent.

Tie materials must resist a working load of 3,150 pounds with no more than 2 percent elongation, and must withstand a 50 percent overload (4,725 pounds total).

Ties shall connect the ground anchor to the main frame longitudinal member. Ties may not connect to steel outrigger beams that fasten to the main frame, unless the manufacturer's installation instructions specifically approve the connection.

Diagonal ties must lie at least 40 degrees from the vertical. Vertical ties must be substantially vertical. If a vertical tie is not substantially vertical, the anchor must be placed outboard of the tie's connection to the main frame.

A cable frame tie shall be connected to the main frame by a 5/8 inch drop forged closed eye bolt through a hole drilled in the center of the I-beam web, or by an approved alternative. The installer shall reinforce the web if necessary to maintain the strength of the I-beam.

The installer shall space the ties as evenly as practical, and shall locate a tie within 8 feet of each end of the mobile home. The installer may attach two or more ties to a single ground anchor if the anchor can carry the total required load. The installer shall install vertical ties at each detached corner of a clerestory roof and of add-on sections of expandable mobile homes.

As a minimum, the installer shall install the following number of ties for each I-beam or other main frame longitudinal member:

Length of Home (feet) (excluding hitch)	Number of Vertical Ties	Number of Diagonal Ties
32-54	2	3
55-73	2	4

Multiple section mobile homes require only diagonal ties. Vertical ties are not required.

[Statutory Authority: RCW 43.22.350 and 43.22.440. 83-01-018 (Order 82-37), § 296-150B-250, filed 12/6/82. Statutory Authority: RCW 43.22.440. 82-09-059 (Order 82-12), § 296-150B-250, filed 4/19/82.]

**WAC 296-150B-255 Assembly.** (1) Sections of a multiple section mobile home shall be aligned, closed, and securely fastened at the required points along the ridge beam, endwalls, and floor line. Heat ducts, electrical connections, and other fixtures and connections required between sections of a mobile home shall be properly installed. The floor of the mobile home shall be level within the tolerances given in the following table.

Tolerances may not exceed the following amounts (L equals the clear span between supports, twice the length of a cantilever):

Floor:	L/240
Roof and ceiling:	L/180
Headers, beams, girders (vertical load):	L/180
Walls and partitions:	L/180

(2) The installer shall provide adequate clearance to ensure that the cross-over heat duct does not touch the ground and is not compressed. The installer shall insulate the cross-over duct at the intersection. The installer shall insulate and seal areas of potential air leaks to ensure that the mobile home is air-tight, and shall seal areas of potential water leaks with metal flashing or trim, if required, and with putty tape or other approved caulking to ensure the mobile home is watertight.

(3) The water pipe connection to the mobile home shall have a main shut off valve in compliance with 24 CFR 3280.609(b) adopted as of April 1, 1982. In all other respects, utility connections to the mobile home, including water, sewer, electricity, and gas, shall comply with local codes. Accessory structures attached to or located next to a home, such as awnings, carports, garages, porches, or steps, shall be constructed in conformance with local codes.

[Statutory Authority: RCW 43.22.440. 82-09-059 (Order 82-12), § 296-150B-255, filed 4/19/82.]

**WAC 296-150B-300 Construction requirements for mobile homes.** Alterations and repairs to mobile homes made after sale to a dealer shall comply with this section.

(1) Subject to the exceptions in subsections (2) and (3) of this section, mobile homes must comply with the current edition of the *Standard for Mobile Homes*, as adopted by the National Fire Protection Association (NFPA) and approved by the American National Standards Institute (ANSI) in ANSI/NFPA 501B current edition.

(2) Mobile homes need not comply with Chapter 1, 1-2 Definitions Common to Chapters 1-5 (see WAC 296-150-015).

(3) Mobile homes must comply with the following provisions of ANSI/NFPA 501B 1982, as amended. Chapter 4, Section 4-6.3.5 Installation of Solid Fuel-Burning Fireplaces and Fireplace Stoves. Subsection (A)1. is amended to read: "A listed factory-built chimney designed to be attached directly to the fireplace or fireplace stove shall be used. The listed factory-built chimney shall be equipped with and contain as part of its listing a termination device and a spark arrester." Subsection (A)3. is amended to read: "The combustion air inlet shall conduct the air directly into the fire chamber and shall be designed to prevent material from the hearth dropping into the area beneath the mobile home."

[Statutory Authority: RCW 43.22.340 through 43.22.445. 86-21-136 (Order 86-32), § 296-150B-300, filed 10/22/86. Statutory Authority: RCW 43.22.340. 85-05-028 (Order 85-5), § 296-150B-300, filed 2/15/85; 82-04-060 (Order 82-4), § 296-150B-300, filed 2/2/82.]

**WAC 296-150B-305 Standards for recreational vehicles.** Recreational vehicles shall comply with the current edition of the *Standard for Recreational Vehicles*,

as adopted by the National Fire Protection Association (NFPA) and approved by the American National Standards Institute (ANSI) ANSI A119.2/NFPA 501C (current edition).

[Statutory Authority: RCW 43.22.340 through 43.22.445, 86-21-136 (Order 86-32), § 296-150B-305, filed 10/22/86. Statutory Authority: RCW 43.22.340, 85-05-028 (Order 85-5), § 296-150B-305, filed 2/15/85; 82-04-060 (Order 82-4), § 296-150B-305, filed 2/2/82.]

**WAC 296-150B-307 Standards for park trailers.**

(1) Subject to the exceptions in subsection (2) of this section, park trailers shall comply with the current edition of Standards for Park Trailers approved by the American National Standards Institute (ANSI) A119.5.

(2) Park models need not comply with the following provisions of ANSI 119.5, 1-2 definitions park trailer items (c) and (e).

[Statutory Authority: RCW 43.22.340 through 43.22.445, 86-21-136 (Order 86-32), § 296-150B-307, filed 10/22/86.]

**WAC 296-150B-310 Construction requirements for recreational vehicles—Power-supply assembly.** In accordance with Sections 4-7.6.4 and 4-7.4.4 of Chapter 4 of ANSI/NFPA 501C 1982, any recreational vehicle with a rating that exceeds 30 amperes, 120 volts, shall use an approved, listed, and appropriately rated 120/240 volt power-supply assembly. However, if a recreational vehicle has a dual power supply source that consists of a generator and a power-supply cord, the recreational vehicle must comply with Section 4-7.8 of Chapter 4 of ANSI/NFPA 501C 1982.

[Statutory Authority: RCW 43.22.340, 85-05-028 (Order 85-5), § 296-150B-310, filed 2/15/85; 82-04-060 (Order 82-4), § 296-150B-310, filed 2/2/82.]

**WAC 296-150B-315 Construction standards for recreational vehicles—Low voltage circuits.** (1) All low-voltage circuits furnished and installed by a recreational vehicle manufacturer are subject to this chapter, except for battery circuits of 24 volts or less if they

(a) Are installed in a recreational vehicle that has no electrical circuits other than battery circuits of 24 volts or less; and

(b) Are used exclusively for the following purposes:

(i) To illuminate lights when the recreational vehicle contains no systems, such as plumbing or heating systems, other than the battery-powered electrical system; or

(ii) To supply power for running lights, taillights, stoplights, electrical braking, or ignition.

(2) The metal frame or chassis of a recreational vehicle may be used as the return path for exterior lighting circuits. Terminals for connection to the frame or chassis shall be of the solderless kind and shall be approved for the size and kind of wire used. Mechanical connections to the frame or chassis shall be made secure.

[Statutory Authority: RCW 43.22.340, 82-04-060 (Order 82-4), § 296-150B-315, filed 2/2/82.]

**WAC 296-150B-400 Definitions.** The following definitions shall apply to WAC 296-150B-400 through 296-150B-820.

(1) "Ceiling height" means the clear vertical distance from the finished floor to the finished ceiling.

(2) "Dead load" means the weight of all permanent construction including walls, floors, roof, partitions, and fixed service equipment.

(3) "Diagonal tie" means a tie intended primarily to resist horizontal or shear forces and which may secondarily resist vertical, uplift, and overturning forces.

(4) "Dormitory" means a room designed to be occupied by more than two guests.

(5) "Dwelling unit" means one or more habitable rooms that are designed to be occupied by one family with facilities for living, sleeping, cooking, eating and sanitation.

(6) "Exit" means a continuous and unobstructed means of egress to a public way.

(7) "Gross floor area" means the net floor area within the enclosing walls of a room in which the ceiling height is not less than five feet.

(8) "Guest room" means a room used or intended to be used by a guest for sleeping purposes. Every one hundred square feet of superficial floor area in a dormitory shall be considered to be a guest room.

(9) "Habitable room" means a room or enclosed floor space arranged for living, eating, food preparation, or sleeping purposes (not including bathrooms, toilet compartment, laundries, pantries, foyers, hallways and other accessory floor spaces).

(10) "Interior finish" means the surface material of walls, fixed or movable partitions, ceilings and other exposed interior surfaces affixed to the commercial coach structure, including any material such as paint or wallpaper. Interior finish does not include decorations or furnishings that are not affixed to the commercial coach structure.

(11) "Live load" means the weight superimposed by the use and occupancy of the commercial coach, including wind load and snow load, but not including dead load.

(12) "Occupancy" means the purpose for which a commercial coach is designed to be used.

(13) "Perimeter blocking" means supports placed under exterior walls.

(14) "Shear wall" means a wall designed and constructed to transfer lateral loads.

(15) "Tiedown" means a device designed to anchor a commercial coach to ground anchors.

(16) "Wind load" means the lateral or vertical pressure or uplift due to wind blowing in any direction.

(17) "Window" means a glazed opening on the exterior of a structure, including glazed doors.

[Statutory Authority: RCW 43.22.340, 82-04-060 (Order 82-4), § 296-150B-400, filed 2/2/82.]

**WAC 296-150B-403 Minimum requirements.** (1) The design and construction of a commercial coach shall conform with the provisions of WAC 296-150B-400 through 296-150B-820. Requirements for any size, weight, or quality of material modified by the terms of "minimum," "not less than," "at least," and similar expressions are minimum standards. The manufacturer or

installer may exceed these standards provided such deviation does not result in any inferior installation or defeat the purpose and intent of the standard.

(2) All construction methods and installations shall conform with this chapter and accepted engineering practices, provide minimum health and safety to the occupants of commercial coaches and the public, and demonstrate acceptable workmanship reflecting journeyman quality of work of the various trades.

(3) When a habitable room is part of a commercial vehicle, the habitable room(s) shall meet egress, ventilation, interior finish, automatic smoke detectors and applicable plumbing, mechanical, and electrical requirements.

[Statutory Authority: RCW 43.22.340. 82-04-060 (Order 82-4), § 296-150B-403, filed 2/2/82.]

**WAC 296-150B-407 Structural analysis.** The strength and rigidity of the components, equipment, and integrated structure shall be determined by engineering analysis or by suitable load tests pursuant to WAC 296-150B-473.

[Statutory Authority: RCW 43.22.340. 82-04-060 (Order 82-4), § 296-150B-407, filed 2/2/82.]

**WAC 296-150B-410 Standards for equipment and installations.** Standards for equipment and installations are listed in WAC 296-150B-530. Equipment and installations conforming to these standards or to other approved standards shall be considered acceptable by the department when listed or labeled and installed in accordance with the requirements of this chapter and the conditions of their approval, except where otherwise provided in this chapter. All equipment shall be clearly labeled to indicate compliance with applicable standards.

[Statutory Authority: RCW 43.22.340. 82-04-060 (Order 82-4), § 296-150B-410, filed 2/2/82.]

**WAC 296-150B-413 Structural design--Requirements.** Each commercial coach shall be designed and constructed as a completely integrated structure capable of sustaining the design load requirements of this chapter and shall be capable of transmitting these loads to stabilizing devices without causing an unsafe deformation or abnormal internal movement of the structure or its structural parts. The commercial coach shall be capable of withstanding the adverse effects of transportation shock and vibration, both as an integrated structure and to its parts.

[Statutory Authority: RCW 43.22.340. 82-04-060 (Order 82-4), § 296-150B-413, filed 2/2/82.]

**WAC 296-150B-417 New materials and methods.**

(1) Any new material or method of construction not provided for in this standard and any material or method of questioned suitability, proposed for use in the manufacture of the structure, shall nevertheless conform in performance to the requirements of this standard.

(2) Unless based on accepted engineering design for the use indicated, all new commercial coach materials,

equipment systems or methods of construction not provided for in this standard shall be subjected to the tests specified in subsection (4).

(3) Allowable design stress. The design stresses of all materials shall conform to accepted engineering practice. The use of materials not identified as to strength or stress grade shall be limited to the minimum allowable stresses under accepted engineering practice.

(4) Alternate test procedures. In the absence of listed and prescribed standards, the manufacturer shall develop or cause to be developed necessary tests, suitable to the department, to demonstrate the structural properties and the significant characteristics of the method employed. The tests shall be made by an approved testing agency or by a licensed professional engineer or architect. Copies of the test results shall be submitted to the department for approval.

[Statutory Authority: RCW 43.22.340. 82-04-060 (Order 82-4), § 296-150B-417, filed 2/2/82.]

**WAC 296-150B-420 Design dead loads.** Design dead loads shall be the actual dead load supported by the structural assembly under consideration.

[Statutory Authority: RCW 43.22.340. 82-04-060 (Order 82-4), § 296-150B-420, filed 2/2/82.]

**WAC 296-150B-423 Design live loads.** The design live loads shall be as specified in WAC 296-150B-427, 296-150B-430, 296-150B-440, 296-150B-450, 296-150B-463, and 296-150B-473 and shall be considered to be uniformly distributed. The roof live load shall not be considered as acting simultaneously with the wind load, and the roof and the floor live loads shall not be considered as resisting the overturning moment due to wind. The roof live load and the floor live load shall be considered to act both simultaneously and separately in order to determine the critical design loading for stresses and deflections.

[Statutory Authority: RCW 43.22.340. 82-04-060 (Order 82-4), § 296-150B-423, filed 2/2/82.]

**WAC 296-150B-427 Standard wind.** When a commercial coach is not designated "hurricane and wind-storm-resistant," the commercial coach and each wind resisting part and portion thereof shall be designed for the following wind loads:

- Horizontal ..... 15 lb/ft<sup>2</sup>  
(1 day load duration)
- Vertical upward ..... 9 lb/ft<sup>2</sup>  
(1 day load duration)
- Vertical downward ... (see WAC 296-150B-430  
Roof loads)

For exposures in areas where records or experience indicate that the commercial coach will be subjected to wind loads in excess of the above loads, the coach shall be designed for the loads to which it will be subjected.

[Statutory Authority: RCW 43.22.340. 82-04-060 (Order 82-4), § 296-150B-427, filed 2/2/82.]

**WAC 296-150B-430 Roof loads.** Flat, curved, and pitched roofs shall be designed to sustain all loadings as follows:

- (1) All dead loads plus a minimum unit live load of 30 lb/ft<sup>2</sup> (2 months load duration).
- (2) A vertical net uplift load of 9 lb/ft<sup>2</sup> (1 day load duration).

[Statutory Authority: RCW 43.22.340. 82-04-060 (Order 82-4), § 296-150B-430, filed 2/2/82.]

**WAC 296-150B-433 Snow loads.** For exposures in areas where snow records or experience indicate that the commercial coach will be subjected to snow loads in excess of 30 lb/ft<sup>2</sup>, the roof shall be designed for the loads to which it will be subjected.

[Statutory Authority: RCW 43.22.340. 82-04-060 (Order 82-4), § 296-150B-433, filed 2/2/82.]

**WAC 296-150B-437 Posting design loads.** The manufacturer shall post the loads the commercial coach has been designed for as follows:

Roof live load . . . . .	_____	psf
Floor live load . . . . .	_____	psf
Wind load . . . . .	_____	psf

Design loads shall be posted on the exterior of the commercial coach. The design loads shall be shown on a label securely affixed to the rear of the vehicle on the lower left hand corner of the exterior wall not less than six inches above the floor line or on the exterior wall immediately adjacent to the main door not less than six inches above floor line.

[Statutory Authority: RCW 43.22.340. 82-04-060 (Order 82-4), § 296-150B-437, filed 2/2/82.]

**WAC 296-150B-440 Design load deflection.** When a structural assembly is subjected to total design live loads, the deflection for structural framing members shall not exceed the following:

Floor . . . . .	L/240
Roof and ceiling . . . . .	L/180
	(see WAC 296-150B-470)
Headers, beams, girders . . . . .	L/180
	(vertical loads only)
Walls and partitions . . . . .	L/180

L = The clear span between supports or two times the length of a cantilever.

[Statutory Authority: RCW 43.22.340. 82-04-060 (Order 82-4), § 296-150B-440, filed 2/2/82.]

**WAC 296-150B-443 Fastening of structural systems.** Roof framing shall be securely fastened to wall framing, walls to floor structure and floor structure to chassis to secure and maintain continuity between the floor and chassis, so as to resist wind uplift, overturning and sliding as imposed by design loads in WAC 296-150B-427. Directions for setup and anchorage shall accompany all commercial coaches.

[Statutory Authority: RCW 43.22.340. 82-04-060 (Order 82-4), § 296-150B-443, filed 2/2/82.]

**WAC 296-150B-447 Instructions.** The manufacturer shall provide printed instructions with each commercial coach specifying the following:

- (1) The location and required capacity of stabilizing devices, (tiedowns, piers, blocking, etc.) on which the design is based.
- (2) Devices and methods to be used in connecting all components and systems including, but not limited to, roofs, walls, floors, frames and utilities.
- (3) Leveling, including releveling.

[Statutory Authority: RCW 43.22.340. 82-04-060 (Order 82-4), § 296-150B-447, filed 2/2/82.]

**WAC 296-150B-450 Walls.** The walls shall be of sufficient strength to withstand the load requirements set out in WAC 296-150B-427, 296-150B-430, and 296-150B-433 without exceeding the deflections specified in WAC 296-150B-440. The connections between the bearing walls, floor, and roof framework members shall be fabricated to provide support for the material used to enclose the commercial coach and to provide for transfer of all lateral and vertical loads to the floor and chassis.

[Statutory Authority: RCW 43.22.340. 82-04-060 (Order 82-4), § 296-150B-450, filed 2/2/82.]

**WAC 296-150B-453 Drilling or notching of wood wall structural members.** Except where substantiated by engineering designs, studs shall not be notched or drilled.

[Statutory Authority: RCW 43.22.340. 82-04-060 (Order 82-4), § 296-150B-453, filed 2/2/82.]

**WAC 296-150B-457 Firestopping.** Firestopping shall be provided in commercial coaches to cut off all concealed draft openings in all stud walls and partitions, including furred spaces, so placed that the maximum vertical dimension of any concealed space is not over eight feet.

[Statutory Authority: RCW 43.22.340. 82-04-060 (Order 82-4), § 296-150B-457, filed 2/2/82.]

**WAC 296-150B-460 Interior walls and partitions.** Interior walls and partitions shall be constructed with structural capacity adequate for the intended purpose and shall be capable of resisting a horizontal load of not less than five pounds per square foot without exceeding the deflections specified in WAC 296-150B-440.

[Statutory Authority: RCW 43.22.340. 82-04-060 (Order 82-4), § 296-150B-460, filed 2/2/82.]

**WAC 296-150B-463 Floors.** (1) Floor assemblies shall be designed in accordance with accepted engineering practice standards to support a minimum uniform and concentrated live load, in accordance with WAC 296-150B-537 and 296-150B-540, plus the dead load of the materials. In addition (but not simultaneously), floors and floor sheathing shall be able to support a 200-pound concentrated load on a one-inch diameter disc at the most critical location with a maximum deflection not to exceed one-eighth inch relative to the floor framing. The floor sheathing shall be able to support a 600-



pound concentrated load on a one-inch diameter disc at the most critical location. Joists of more than six inches depth shall be stabilized against overturning from superimposed loads as follows: At ends by solid blocking not less than two-inch thickness by full depth of joist, or by connecting to a continuous header not less than two-inch thickness and not less than the depth of the joist with connecting device; at eight-foot maximum intermediate spacing by solid blocking or by wood cross-bridging of not less than one inch by three inches, metal cross-bridging of equal strength, or by other approved methods.

(2) Wood floors or subfloors in kitchens, bathrooms (including toilet compartments), laundry rooms, water heater compartments, and any other areas subject to excessive moisture shall be moisture resistant or shall be made moisture resistant by sealing or by an overlay of nonabsorbent material applied with water-resistant adhesive.

[Statutory Authority: RCW 43.22.340. 82-04-060 (Order 82-4), § 296-150B-463, filed 2/2/82.]

**WAC 296-150B-467 Drilling or notching of wood joist structural members.** Except where substantiated by engineering design, notches on the ends of joists shall not exceed one-fourth the joist depth. Holes bored in joists shall not be within 2 inches of the top or bottom of the joist, and the diameter of any such hole shall not exceed one-third of the depth of the joist. Notches in the top or bottom of the joists shall not exceed one-sixth the depth and shall not be located in the middle third of the span. Joists in transverse floor framing systems, which do not have perimeter blocking, shall not be drilled or notched without substantiation by engineering design or approved tests.

[Statutory Authority: RCW 43.22.340. 82-04-060 (Order 82-4), § 296-150B-467, filed 2/2/82.]

**WAC 296-150B-470 Roof trusses.** All roof truss construction shall be first approved by a licensed professional engineer or architect and subsequently approved by the department. Roof trusses shall be tested as directed in ANSI/NFPA 501B-1977, Appendix to chapter 2. Initial certification tests shall be performed using certified minimum quality of materials (lowest of the grade) and workmanship.

Any one of the three following options may be used in production:

(1) Stress graded materials must be used in the manufacture of rafters and trusses.

(2) Nongraded materials may be used if each truss is tested in an approved testing jig at the manufacturer's site with a load equivalent to full design load. (1.75 times the full design load sustained for 12 hours.)

(3) The manufacturer shall employ an approved testing agency to certify the rafter and truss construction and to test the rafters and trusses as to required loads. The testing agency is to prepare an approved quality control program and to test the rafters and trusses in accordance with sound testing procedures.

(4) When requested by the department, representative trusses taken from the production line shall be tested and a report furnished to the department by the approved testing agency or a licensed architect or civil or structural engineer. Unless there are apparent problems with the trusses, the frequency of these tests shall not exceed two times per year per design.

(5) The manufacturer shall be required to maintain an acceptable quality level not to exceed 1% using acceptable sampling procedures. (The acceptable quality level is defined as the maximum percentage of defective units.)

(6) All test reports are to be stamped, signed, and dated by a licensed professional engineer.

[Statutory Authority: RCW 43.22.340. 82-04-060 (Order 82-4), § 296-150B-470, filed 2/2/82.]

**WAC 296-150B-473 Structural load test.** Structural assemblies or subassemblies tested for qualification shall sustain the design dead load (see WAC 296-150B-420), plus the superimposed design live loads (see WAC 296-150B-423) equal to 1.75 times the required live loads for a period of 12 hours without failure, unless otherwise specified in this chapter. Failure shall be considered rupture, fracture, or residual deflection which is greater than the limits set in WAC 296-150B-440. An assembly or subassembly to be tested shall be representative of the minimum quality of materials of the group of assemblies or subassemblies as ordinarily manufactured. Each test assembly, component or subassembly shall be identified as to type and quality or grade of material. Structural load tests or other tests based on nationally recognized standards may be approved. Submit the test procedure to the department for approval before proceeding with the tests.

[Statutory Authority: RCW 43.22.340. 82-04-060 (Order 82-4), § 296-150B-473, filed 2/2/82.]

**WAC 296-150B-477 Roof coverings.** (1) General. The roof covering shall be securely fastened in an approved manner to the supporting roof construction and shall provide weather protection for the commercial coach and the occupants. All roof decks shall be designed with sufficient slope or camber to assure adequate drainage, or shall be designed to support maximum loads including possible ponding of water due to deflection. The roof covering shall be installed in accordance with the manufacturer's instructions and as approved by the department.

(2) Construction. All roofs shall be so framed and tied into the framework and supporting walls as to form an integral part of the commercial coach. All trusses shall be laterally braced.

(3) Roofing membranes shall be of sufficient rigidity to prevent deflection that would permit ponding of water or separation of seams due to snow and wind, or erection or transportation forces.

(4) Cutting of roof framework members for passage of electrical, plumbing, or mechanical systems shall not be allowed except where substantiated by engineering analysis.



(5) Electrical, plumbing, or mechanical systems shall not penetrate the roofing membrane unless the penetration point is adequately sealed.

[Statutory Authority: RCW 43.22.340. 82-04-060 (Order 82-4), § 296-150B-477, filed 2/2/82.]

**WAC 296-150B-480 Flame-spread limitations and combustibility.** (1) The surface flame-spread rating of interior finish materials shall not exceed the following when tested by the Standard Method of Test for Surface Burning Characteristics of Building Materials, ASTM E84. Testing shall be by an approved testing agency.

(a) The interior finish of all walls and partitions shall have a flame-spread rating not exceeding 200 except as otherwise specified in this section. The flame-spread limitation shall not apply to molding, trim, windows, doors or series of doors not exceeding 4 feet in width, and permanently attached decorative items such as pictures or accent panels constituting not more than 10 percent of the aggregate wall surface in any room or space nor more than 32 square feet in surface area, whichever is less.

(b) All ceiling interior finish shall have a flame-spread rating not exceeding 200, excluding molding and trim 2 inches or less in width.

(c) Furnace and water heater spaces shall be enclosed by walls, ceiling, and doors having an interior finish with a flame-spread rating not exceeding 200.

(d) Combustible kitchen cabinet doors, countertops, exposed bottoms, and end panels shall not exceed a flame-spread rating of 200. Cabinet rails, stiles, mullions, and toe strips are exempted.

(e) Exposed interior finishes adjacent to the cooking range shall have a flame-spread rating not exceeding 50. Adjacent surfaces are the exposed vertical surfaces between the range top height and the overhead cabinets or ceiling and within 6 horizontal inches of the cooking range.

(f) Finish surfaces of plastic bath tubs, shower units and tub or shower doors shall not exceed a flame-spread rating of 200.

(2) Combustibility. The exposed wall adjacent to the cooking range, as defined in subsection (1)(e), shall be surfaces with 5/16 inch gypsum board or material having equivalent fire protective properties. At furnace and water heater spaces, all openings for pipes and vents shall be tight-fitted or firestopped.

[Statutory Authority: RCW 43.22.340. 82-04-060 (Order 82-4), § 296-150B-480, filed 2/2/82.]

**WAC 296-150B-483 Kitchen cabinet protection.** The bottom and sides of combustible kitchen cabinets over cooking ranges or tops including a space of 6 inches from the edge of the burners shall be protected with at least 1/4 inch thick asbestos millboard covered with not less than 26 gage sheet metal (.017 stainless steel, .024 aluminum or .020 copper) or equivalent protection. The protective metal over the range shall form a hood with not less than a 3-inch eyebrow (measuring horizontally from face of cabinet). The hood shall be centered over and shall be at least as wide as the cooking range or top.

[Title 296 WAC—p 1880]

[Statutory Authority: RCW 43.22.340. 82-04-060 (Order 82-4), § 296-150B-483, filed 2/2/82.]

**WAC 296-150B-487 Carpeting.** (1) Surface flammability of carpets and rugs shall at least meet the Department of Commerce Standard DOCFF 1 test.

(2) Carpeting shall not be used under a heat-producing appliance.

(3) Carpet and carpet pads shall not be installed in concealed spaces subject to excessive moisture such as under plumbing fixtures.

(4) Carpet and carpet pads shall not be installed beneath the bottom plate of shear, bearing, or exterior walls.

[Statutory Authority: RCW 43.22.340. 82-04-060 (Order 82-4), § 296-150B-487, filed 2/2/82.]

**WAC 296-150B-490 Undervehicle closure material.** Undervehicle closure material and method of construction shall be such as to resist damage that would permit penetration of the underside of the commercial coach by air, water, rodents, insects, or dust. The closure material shall be listed and installed as follows:

(1) Fibrous material (with or without patches) shall meet or exceed the level of 48 inch-pounds of puncture resistance as tested by the Beach Puncture Test in accordance with ASTM designation D 781-68.

(2) The material shall be installed in accordance with installation instructions furnished by the supplier of the material.

(3) The material shall be suitable for patches and the patch life shall be equivalent to the material life. Patch installation instructions shall be included in the commercial coach manufacturer's instructions.

[Statutory Authority: RCW 43.22.340. 82-04-060 (Order 82-4), § 296-150B-490, filed 2/2/82.]

**WAC 296-150B-497 Bathroom.** Each bathroom shall be provided with artificial light and with external windows or doors having not less than 1/2 square feet of fully openable glazed area, except where a mechanical ventilation system capable of producing a change of air every 12 minutes is provided. Any mechanical ventilation system shall exhaust directly to the outside of the commercial coach.

[Statutory Authority: RCW 43.22.340. 82-04-060 (Order 82-4), § 296-150B-497, filed 2/2/82.]

**WAC 296-150B-500 Glass and glazed openings.** (1) Application. The provisions of this section shall apply to the installation of glass or glazed openings including hazardous locations as indicated in WAC 296-150B-533.

(2) Standards and identification. Safety-glazing materials shall meet the requirements of American National Standards Institute (ANSI) Standard Z-97, 1-1975.

(3) Louvered windows. Plate, float, sheet or patterned glass in jalousies and louvered windows shall be not thinner than nominal 3/16-inch and no more than 40 inches in length. Exposed edges shall be smooth.

(1989 Ed.)

(4) Wind loads and glass area limitations. Exterior glass and glazing shall be capable of withstanding a wind load pressure of 20 pounds per square foot acting inward or outward.

(5) Glazing and hazardous locations. For safety glazing installed in hazardous locations such as sliding glass doors, storm doors, exit and entrance doors, and fixed glass panels located within 18 inches of the floor or equivalent surface, shower or tub enclosures or their doors to a height of 6 feet above the fixture floor shall meet the requirements set forth in WAC 296-150B-533.

[Statutory Authority: RCW 43.22.340. 82-04-060 (Order 82-4), § 296-150B-500, filed 2/2/82.]

**WAC 296-150B-503 Fire warning equipment--Automatic smoke detectors.** (1) General. At least one listed smoke detector (which may be a single station smoke detector) shall be installed in each commercial coach to protect each separate bedroom. Smoke detectors shall meet the requirements of the Standard for Single and Multiple Station Smoke Detectors of the Underwriters Laboratories Inc. (UL 217-1976).

(2) Smoke detector location. A smoke detector shall be installed in the hallway or space communicating with the bedroom, and shall be mounted, where possible, between the living area and the first bedroom door on an interior wall. Where such mounting cannot be achieved due to limited interior wall space, the smoke detector shall be located as close as practical to the first bedroom door on an interior wall. Commercial coaches having bedrooms separated by one or a combination of common use areas (such as a kitchen, dining room, living room, or family room, but not a bathroom or utility room) shall have at least two smoke detectors, one smoke detector protecting each bedroom.

(3) Installation. Smoke detectors shall be installed on an interior wall of the commercial coach. The top of the detector shall be 5 to 7 inches from the ceiling. The smoke detector mounting shall be attached to an electrical outlet box and the detector shall be permanently wired into a general purpose electrical circuit. There shall be no switches in the circuits to the detectors other than the circuit breaker serving the circuits.

(4) The commercial coach manufacturer shall provide a copy of the testing and maintenance instructions supplied by the manufacturer of the smoke detector for the information of the consumer and users of the commercial coach.

[Statutory Authority: RCW 43.22.340. 82-04-060 (Order 82-4), § 296-150B-503, filed 2/2/82.]

**WAC 296-150B-507 Room and hallway sizes.** (1) Rooms designed for sleeping purposes shall have a minimum gross square foot floor area as follows:

One person .....	50
Two persons .....	70
Each person in excess of two .....	50

(2) Every habitable room shall have a minimum ceiling height of not less than 7 feet.

(3) No habitable room, except a kitchen, shall be less than five feet in any clear horizontal dimension.

(4) Each toilet compartment shall be a minimum of 30 inches in width and have at least 21 inches of clear space in front of each toilet.

(5) Hallways shall have a minimum horizontal dimension of 32 inches.

[Statutory Authority: RCW 43.22.340. 82-04-060 (Order 82-4), § 296-150B-507, filed 2/2/82.]

**WAC 296-150B-508 Insulation standards.** Insulation standards for commercial coaches shall comply with the State Energy Code as adopted by the state building code council in chapters 51-12 and 51-16 WAC and is therefore adopted except where a state law supersedes a code provision.

[Statutory Authority: RCW 43.22.340 through 43.22.445. 86-21-136 (Order 86-32), § 296-150B-508, filed 10/22/86.]

**WAC 296-150B-510 Handicap standards.** When applicable, a commercial coach shall comply with the standards set by the Washington state building code in RCW 19.27.030(5) requiring buildings and facilities to be accessible to and usable by physically handicapped and elderly persons.

[Statutory Authority: RCW 43.22.340. 82-04-060 (Order 82-4), § 296-150B-510, filed 2/2/82.]

**WAC 296-150B-513 Light and ventilation.** Habitable rooms shall be provided with exterior windows or doors having a total glazed area of not less than 10 percent of the floor area, or shall be provided with artificial light. An area equivalent to not less than 5 percent of the floor area shall be available for unobstructed ventilation. Glazed areas need not be openable where a mechanical ventilation system is provided and is capable of producing a change of air in the room(s) every thirty minutes with not less than one-fifth of the air supply taken from outside the commercial coach.

[Statutory Authority: RCW 43.22.340 through 43.22.445. 87-21-040 (Order 87-20), § 296-150B-513, filed 10/14/87. Statutory Authority: RCW 43.22.340. 82-04-060 (Order 82-4), § 296-150B-513, filed 2/2/82.]

**WAC 296-150B-515 Heating, cooling, and ventilation requirements for portable classrooms.** Portable classrooms shall comply with the following space control requirements.

(1) Mechanical ventilation.

(a) Portable classrooms shall be provided with a tempered air mechanical ventilation system, automatically controlled.

(b) The air supply volume shall be no less than 1.3 cubic feet per minute (c.f.m.) per square foot of floor area in portable classrooms.

(c) The system shall be provided with an economizer cycle to automatically mix recirculated air and outside air, to provide atmospheric cooling. The air supply system shall be arranged to modulate the amount of outdoor air from minimum setting to one hundred percent outside air during the nonheating period.

(d) The minimum amount of outside air introduced after the room is up to setpoint temperature during occupancy shall not be less than 10 c.f.m. per occupant.

(2) Heating. The system shall provide a temperature differential in the occupied zone not to exceed plus or minus 2°F. Air supply systems shall be provided with a means to discharge air which shall not generate a noise level over 35 N.C. The terminal air velocities in occupied zone shall not exceed 50 feet per minute (f.p.m.).

(3) Temperature control. A system of automatic temperature controls shall be provided which will automatically maintain space setpoint temperature, 72°F heating, 78°F cooling, if cooling is provided, including night setback operation with intermittent fan operation, zero percent outside air and night setback temperature (55°F). Controls shall include seven day scheduling.

(4) Cooling. Mechanical refrigeration is optional. Cooling systems shall be of sufficient capacity to maintain cooling setpoint previously mentioned, under A.S.H.R.A.E. design conditions for the location in which the portable classroom is installed based on 2.5 percentile—dry and wet bulb temperatures. Ventilation rate shall be 10 c.f.m. (cu.ft./min.) per occupant under mechanical cooling cycle operation.

(5) Professional design requirements. Portable classroom design drawings shall incorporate a heating, ventilating (and air conditioning where applicable) design prepared by a professional engineer, registered in Washington state, and experienced in the heating, ventilating and air conditioning field. The engineer's seal shall be affixed to said drawings.

[Statutory Authority: RCW 43.22.340 through 43.22.445. 87-21-040 (Order 87-20), § 296-150B-515, filed 10/14/87.]

**WAC 296-150B-517 Exit facilities.** (1) Commercial coaches shall have a minimum of two exterior doors located remote from each other and so arranged as to provide a means of unobstructed travel to the outside of the commercial coach.

(2) Exterior doors shall be constructed for exterior use and in no case provide less than a 35-inch wide by 79-inch high clear opening (36" x 80" door). Each swinging exterior door shall have a key-operated lock that has a deadlocking latch. A deadlock with a passage set installed below the deadlock may be used as an acceptable alternate for each exterior door. The locking mechanism of the lock shall be engaged or disengaged by the use of a lever, knob, button, handle, or other device from the side from which egress is to be made when the commercial coach is occupied. Locks shall not require the use of a key for operation from the inside.

(3) The department may grant a variance to the two door and/or the minimum door size and locking mechanism requirements for special commercial coach usage or conditions. A commercial coach that is 24 feet or less in length and 14 feet or less in width needs only one exit door, unless it has a sleeping area.

(4) Every room designed expressly for sleeping purposes, unless it has an exit door, shall have at least one outside window which can be opened from the inside without the use of tools to provide a clear opening of not

less than 22 inches in its smallest dimension and 5 square feet in area with the bottom of the opening not more than 3 feet above the floor.

Where a screen or storm window is required to be removed from this window to permit emergency egress, it shall be readily removable without requiring the use of tools.

[Statutory Authority: RCW 43.22.340. 82-04-060 (Order 82-4), § 296-150B-517, filed 2/2/82.]

**WAC 296-150B-520 Weather resistance.** Exterior covering shall be of moisture and weather-resistant materials attached with corrosion-resistant fasteners to resist wind and rain deterioration. Electro-plated, electro-deposited zinc, electro-galvanized, etc. staples shall not be considered as qualifying as corrosion resistant. Metal covering shall be of corrosion-resistant materials.

[Statutory Authority: RCW 43.22.340. 82-04-060 (Order 82-4), § 296-150B-520, filed 2/2/82.]

**WAC 296-150B-523 Windstorm protection.** (1) Provisions for support and anchoring systems. Each commercial coach shall have provisions for support and anchoring systems that, when properly designed and installed, will resist overturning and lateral movement of the commercial coach as imposed by the respective design loads, and shall be designed by a licensed professional engineer or architect.

(2) The manufacturer of each commercial coach is required to make provision for the support and anchoring systems but is not required to provide the anchoring equipment or stabilizing devices.

(3) The manufacturer shall provide printed instructions with each commercial coach specifying the location and required capacity of stabilizing devices on which the design is based.

(4) The provisions made for anchoring systems shall be based on the following design criteria for single-wide commercial coaches:

(a) The minimum number of ties required per side shall be in accordance with WAC 296-150B-527.

(b) Ties shall be as evenly spaced as practicable along the length of the commercial coach with not more than 8 feet open-end spacing on each end.

(c) When continuous straps are provided as vertical ties, such ties shall be positioned at rafters and studs. Where a vertical tie and diagonal tie are located at the same place, both ties may be connected to a single ground anchor, provided that the anchor used is capable of carrying both loadings.

(d) Add-on sections of expandable commercial coaches shall have provisions for vertical ties at the exposed ends.

(5) Double-wide commercial coaches require only the diagonal ties specified in the following table. These shall be placed along the outer side walls.

(6) Protection shall be provided at sharp corners where the anchoring system requires the use of external cables or straps. Protection shall also be provided to minimize damage to roofing or siding by the cable or strap.

(7) Anchoring equipment shall be capable of resisting an allowable working load equal to or exceeding 3,150 pounds and shall be capable of withstanding a 50 percent overload (4,725 pounds total) without failure of either the anchoring equipment or the attachment point on the commercial coach.

(8) Anchoring equipment exposed to weathering shall have a resistance to weather deterioration at least equivalent to that provided by a coating of zinc on steel of not less than 0.30 ounces per square foot of surface coated.

(a) Slit or cut edges of zinc-coated steel strapping do not need to be zinc-coated.

(b) Type 1, Class B, Grade 1 steel strapping, 1 1/4 inches wide and 0.035 inch thick, conforming with Federal Specification QQ-S-781-G, is judged to conform with the provisions of this paragraph.

[Statutory Authority: RCW 43.22.340. 82-04-060 (Order 82-4), § 296-150B-523, filed 2/2/82.]

**WAC 296-150B-527 Table--Ties required per side of single width commercial coach.**

**Number of Ties Required Per Side of Single Width Commercial Coaches**

This table is based on a minimum working load per anchor of 3,150 pounds with a 50 percent overload (4,725 pounds total).

Length of Commercial Coach (Feet) <sup>2,4</sup>	Hurricane Resistive	Hurricane Resistive	Non-Hurricane Resistive	Non-Hurricane Resistive
	No. of Vertical Ties	No. of Diagonal Ties <sup>3</sup>	No. of Vertical Ties	No. of Diagonal Ties <sup>3</sup>
32-40	2	4	2	3
41-46	2	4	2	3
47-49	2	5	2	3
50-54	3	5	2	3
55-58	3	5	2	4
59-64	3	6	2	4
65-70	3	6	2	4
71-73	3	7	2	4
74-84	4	7	2	5

- (1) Double-width commercial coaches require only the diagonal ties specified in column 3 or 5, and these shall be placed along the outer side walls.
- (2) Length of commercial coach (as used in this table) means length excluding draw bar.
- (3) Diagonal ties in this method shall deviate at least 40° from a vertical direction.
- (4) In commercial coaches less than 32' long, the number of ties shall be according to engineering analysis approved by the department.

[Statutory Authority: RCW 43.22.340. 82-04-060 (Order 82-4), § 296-150B-527, filed 2/2/82.]

**WAC 296-150B-530 Table--Accepted engineering practice standards.**

**ACCEPTED ENGINEERING PRACTICE STANDARDS**

This table is included for information purposes.

**ALUMINUM**

Aluminum Construction Manual, Specifications for Aluminum Structures ..... AA-1976

**STEEL**

Specification for the Design, Fabrication and Erection of Structural Steel for Buildings ..... AISC-1969+

Specification for the Design of Cold-Formed Steel Structural Members ..... AISI-1968++

Specification for the Design of Light-Gage Cold-Formed Stainless Steel Structural Members ..... AISI-1974

Standard Specifications for Open Web Steel Joists, J- and H-Series ..... SJI and AISC-1974

**WOOD AND WOOD PRODUCTS**

Hardboard ..... AHA PS 58, 59, & 60-1973

Hardwood and Decorative Plywood ..... USDC PS 51-71

Structural Design Guide for Hardwood Plywood ..... HPMASG-71

Inspection Manual for Structural Glued Laminated Timber ..... AITC-200-1973

Timber Construction Manual .. AITC-1974 (2nd Ed.)

Structural Glued Laminated Timber ..... USDC PS, 56-73

Plywood--Construction & Industrial ..... USDC PS 1-74

Plywood Commercial/Industrial Construction Guide ..... APA-Y300-1976

Plywood Residential Construction Guide ..... APA-Y405-1976

Plywood Design Specification ..... APA-Y510-1977

Plywood Design Specification Supplement No. 2 - "Plywood Beams" ..... APA-S812-1977

Plywood Design Specification Supplement No. 3 - "Stressed Skin Panels" ..... APA-U813-1977

Plywood Fabrication Specification GT-8 "Trussed Rafters" ..... APA-W395-1974

Plywood Fabrication Specification BB-8 "Plywood Beams" ..... APA-V375-1975

Plywood Fabrication Specification SS-8 "Stress Skin Panels" ..... APA-V340-1974

All Plywood Beams for Mobile Homes, Report 124 ..... APA-Y490-1976

Plywood Diaphragm Construction ... APA-U310-1976

Stress Grade Lumber and its Fastenings -- National Design Specifications for ..... (N) FPA-1977

- Structural Design Data — Wood . . . . . (N) FPA-1977  
Span Tables for Joists and Rafters  
(PS 20-70) . . . . . (N) FPA-1977  
Working Stresses for Joists and  
Rafters . . . . . (N) FPA-1977\*  
Timber Construction Standards . . . . . AITC-100-1976  
Design Specifications for Light  
Metal Plate Connected Wood  
Trusses . . . . . TPI-74  
Mat-Formed Wood Particleboard  
(Type 2) . . . . . CS 236-66
- FIRE SAFETY**  
Method of Test for Surface Burn-  
ing Characteristics of Building  
Materials . . . . . ASTM E84-76a.  
Method of Test for Surface  
Flammability of Materials Us-  
ing Radiant Heat Energy  
Source . . . . . ASTM E162-76.  
Safety to Life from Fire in Build-  
ings and Structures . . . . . ANSI/NFPA No. 101-76  
Standard for the Installation,  
Maintenance and Use of  
Household Fire Warning Equip-  
ment . . . . . NFPA No. 74-1975
- WINDOWS AND GLAZING**  
Transparent Safety Glazing Mate-  
rial Used in Buildings . . . . . ANSI Z97.1-1975
- UNCLASSIFIED**  
ASHRAE Handbook of Funda-  
mentals — 1977  
Building Code Requirements for  
Minimum Design Loads in  
Buildings and Other Structures . . . . . ANSI A58.1-1972  
Pneumatic and Mechanically  
Driven Building Construction  
Fasteners . . . . . HUD-FHA Bulletin  
No. UM-25d  
(Published by HUD, I-SANTA, and FIT)  
Nails, Brads, Staples and Spikes;  
Wire, Cut and Wrought . . . . . FF-N-105B  
(Published by U.S. Gov't Print-  
ing Office and available from  
GSA, FIT and I-SANTA)
- AMA — American Board Products Association, 205  
West Toulay Ave., Park Ridge, Illinois 60068.  
AISC — American Institute of Steel Construction, 1221  
Avenue of the Americas, New York, N.Y. 10020.  
AISI — American Iron and Steel Institute, 1000 16th St.  
NW, Washington, DC 20036.  
AITC — American Institute of Timber Construction, 333  
West Hampden Ave., Englewood, Colorado 80110.  
ANSI — American National Standards Institute, 1430  
Broadway, New York, N.Y. 10017.  
APA — American Plywood Association, 1119 A Street,  
Tacoma, Washington 98401.  
ASHRAE — American Society of Heating, Refrigeration  
and Airconditioning Engineers, 345 East 47th  
Street, New York, N.Y. 10017.  
ASTM — American Society for Testing and Materials,  
1916 Race Street, Philadelphia, Pennsylvania  
19103.  
CS — Commercial Standards — available from Sup't. of  
Documents, U.S. Government Printing Office,  
Washington, D.C. 20402.  
FIT — Fastener Institute of Tectonics, P.O. Box 5490,  
Hacienda Heights, California 91745.  
HPMA — Hardwood Plywood Manufacturers Assn.,  
P.O. Box 6246, Arlington, Virginia 22206.  
HUD — U.S. Department of Housing and Urban Devel-  
opment, Washington, DC 20411.  
I-SANTA — Industrial Staple and Nailing Technical  
Association, 435 N. Michigan Ave., Suite 1717,  
Chicago, Illinois 60611.  
NFPA — National Fire Protection Assn., 470 Atlantic  
Avenue, Boston, Massachusetts 02210.  
(N) FPA — National Forest Products Association (for-  
merly National Lumber Manufacturers Assn.),  
1619 Massachusetts Ave. N.W., Washington, D.C.  
20036.  
NPA — National Particleboard Association, 2306  
Perkins Place, Silver Spring, Maryland 20910.  
PFS — Product Fabrication Service, 1619 West Beltline  
Highway, Madison, Wisconsin 53713.  
PS — Product Standard — available from Sup't. of Docu-  
ments, U.S. Government Printing Office,  
Washington, D.C. 20402.  
SJI — Steel Joist Institute, 2001 Jefferson Davis High-  
way, Arlington, Virginia 22202.  
TPI — Truss Plate Institute, 7100 Baltimore Ave., Col-  
lege Park, Maryland 20740.  
UL — Underwriters' Laboratories, Inc., 333 Pfingsten  
Road, Northbrook, Illinois 60062.  
USDC — United States Department of Commerce,  
Washington, D.C. 20234.

+ Supplements Nos. 1, 2 and 3—November 1, 1970,  
December 8, 1971 and June 12, 1974.

++ With Addendum No. 1, dated November 19, 1970,  
and Addendum No. 2, dated February 4, 1977.

\* Supplement issued December, 1972.

AA — The Aluminum Association, 750 Third Ave., New  
York, N.Y. 10017.

**WAC 296-150B-533 Table--Glazing in hazardous locations.**

GLAZING IN THE FOLLOWING SPECIFIC HAZARDOUS LOCATIONS SHALL MEET THE FOLLOWING REQUIREMENTS:

Specific Hazardous Locations	Size of Individual Glazed Area	Requirements <sup>2</sup>
Glazing in exit and entrance doors	Over 6 sq. ft.	Each glazed area shall pass the requirements of ANSI Standard Z97.1—1975 if not protected by a protective grille <sup>1</sup> firmly attached to stiles on each exposed side.
Glazing in storm doors	Over 2 sq. ft.	Each glazed area shall pass the requirements of ANSI Standard Z97.1—1975 if not protected by a protective grille <sup>1</sup> firmly attached to stiles on each exposed side.
Glazing in sliding exterior doors	All Sizes	Each glazed area shall pass the requirements of ANSI Standard Z97.1—1975.
Glazing in all unframed doors (swinging)	All Sizes	Each glazed area shall be fully tempered glass and pass the requirements of ANSI Standard Z97.1—1975.
Glazing in shower doors and tub enclosures	All Sizes	Each glazed area shall pass the test requirements of ANSI Standard Z97.1—1975 except Section 4.3.
Other fixed glazed panels located within 12 inches on either side of exit and entrance doors	Over 18 inches	Each glazed area within 18 inches of the floor shall pass the requirements of ANSI Standard Z97.1—1975 unless the glazed area is protected by a barrier within 12 inches immediately in front of the glazing.

<sup>1</sup>Shall be constructed and attached in such a manner so as to prevent human impact from being transmitted to glass surface.

<sup>2</sup>Annealed glass less than single strength in thickness shall not be used. If short dimension is larger than 24 inches, annealed glass must be double strength or thicker.

[Statutory Authority: RCW 43.22.340, 82-04-060 (Order 82-4), § 296-150B-533, filed 2/2/82.]

**WAC 296-150B-537 Table--Minimum uniformly distributed live loads.**

MINIMUM UNIFORMLY DISTRIBUTED LIVE LOADS

Occupancy or Use	Live Load psf
Apartments (see Residential)	
Assembly halls and other places of assembly:	
Fixed seating	50
Movable seating and other areas	100
Corridors (same as occupancy served except as indicated)	
Dining rooms and restaurants	100
Dwellings (see Residential)	
Hospitals	
Operating rooms	60
Private rooms	40
Wards	40
Hotels (see Residential)	
Libraries	
Reading rooms	60
Stack rooms	150
Manufacturing or Storage	
Light	125
Heavy	250
Office Units	
Offices (including job shacks)	50
Lobbies	100
Residential	
Multifamily units:	
Private apartments	40
Public rooms	100
Corridors	80
Single family units	40
Schools	
Classrooms	40
Corridors	80
Stores	
Retail	75
Theaters	
Aisles, corridors and lobbies	100

[Statutory Authority: RCW 43.22.340. 82-04-060 (Order 82-4), § 296-150B-537, filed 2/2/82.]

**WAC 296-150B-540 Table--Concentrated live loads.**

CONCENTRATED LIVE LOADS

Location	Loads in pounds*
Office floors (except 8' and 10' wide units)	2,000
Schools and 10' wide office floors	1,000

\*Uniformly distributed over a 2 1/2 foot square area placed anywhere on the floor without the uniform live load present.

[Statutory Authority: RCW 43.22.340. 82-04-060 (Order 82-4), § 296-150B-540, filed 2/2/82.]

**WAC 296-150B-543 Interior privacy.** A commercial coach interior door, when provided with a privacy lock, shall have a privacy lock that has an emergency release on the outside to permit entry when lock has been locked by a locking knob, lever, button, or other locking device on the inside.

[Statutory Authority: RCW 43.22.340. 82-04-060 (Order 82-4), § 296-150B-543, filed 2/2/82.]

**WAC 296-150B-547 Interior passage.** Commercial coach interior doors having passage hardware shall open from either side by a single movement of the hardware mechanism.

[Statutory Authority: RCW 43.22.340. 82-04-060 (Order 82-4), § 296-150B-547, filed 2/2/82.]

**WAC 296-150B-550 Electrical--General.** Electrical equipment and installations in or on a commercial coach shall be installed in accordance with requirements of the National Electrical Code, as adopted by chapter 19.28 RCW and the rules adopted under that chapter, unless otherwise specifically exempted or required by these rules. The provisions of this section are also applicable to the alteration or conversion of electrical equipment and installations in any commercial coach bearing or required to bear a department insignia of approval.

[Statutory Authority: RCW 43.22.340 through 43.22.445. 86-21-136 (Order 86-32), § 296-150B-550, filed 10/22/86. Statutory Authority: RCW 43.22.340. 82-04-060 (Order 82-4), § 296-150B-550, filed 2/2/82.]

**WAC 296-150B-553 Definitions.** Definitions contained in the National Electrical Code, current edition, and the following definitions shall apply to the commercial coach standards.

(1) Converter means a device that changes electrical energy from one form to another, as from alternating current to direct current.

(2) Feeder assembly means the overhead or under-chassis feeder conductor, including the grounding conductor, together with the necessary fittings and equipment or a power-supply cord approved for mobile home use, designed to deliver energy from the source of electrical supply to the distribution panelboard within a commercial coach.

(3) Low voltage means an electromotive force rated at 24 volts or less, supplied from a transformer, converter, or battery.

(4) N.E.C. means the National Electrical Code, as adopted by chapter 19.28 RCW and the rules adopted under that chapter.

[Statutory Authority: RCW 43.22.340 through 43.22.445. 86-21-136 (Order 86-32), § 296-150B-553, filed 10/22/86. Statutory Authority: RCW 43.22.340. 82-04-060 (Order 82-4), § 296-150B-553, filed 2/2/82.]

**WAC 296-150B-557 Low-voltage systems--Low-voltage circuits.** (1) Low-voltage circuits furnished and installed by the commercial coach manufacturer are subject to these rules, except that commercial coaches containing only battery circuits of 24 volts or less supplying energy exclusively for the following are not subject to this section:

(a) Illuminating lights when the commercial coach contains no other systems such as plumbing, heating, or electrical over 24 volts; and

(b) Circuits supplying running lights, taillights, stop lights, electrical braking, or vehicle ignition systems.

(2) Low-voltage wiring materials.

(a) Copper or copper-clad aluminum conductors shall be used for low-voltage circuits.

(b) The insulation of low-voltage conductors used in battery and direct current circuits shall be rated at least 60°C.

(c) Conductors furnished and installed by the commercial coach manufacturer shall have a minimum of 30 mils thermoplastic insulation or equal.

(d) The insulation of outdoor or under-chassis wire shall be moisture and heat resistant, type THW or equivalent.

(e) Single-wire, low-voltage conductors shall be of the stranded type.

(3) Low-voltage wiring methods.

(a) Conductors shall be protected against physical damage and shall be secured.

(b) Conductors shall be spliced or joined with approved splicing devices or by brazing, welding, or soldering with a fusible metal or alloy. Soldered splices shall first be so spliced or joined as to be mechanically and electrically secure without solder and then soldered. All splices, joints and free ends of conductors shall be covered with an insulation equivalent to that on the conductors.

(c) Low-voltage circuits shall be physically separated by at least a 1/2 inch gap or other approved means, from wiring of circuits in excess of 24 volts. This may be accomplished by clamping, routing, or equivalent means that ensure permanent total separation.



(4) Battery installations. Storage batteries subject to the provisions of this standard shall be securely attached to the commercial coach and installed in an area vaportight to the interior and ventilated directly to the exterior of the commercial coach. When batteries are installed in a compartment, the compartment shall be ventilated with openings of not less than 2 square inches at the top and 2 square inches at the bottom. Batteries shall not be installed in a compartment containing spark or flame producing equipment, except that they may be installed in an engine generator compartment if the only charging source is from the engine generator.

(5) Overcurrent protection.

(a) Low-voltage circuit wiring shall be protected by overcurrent protective devices rated not in excess of the ampacity of the conductors, as follows:

Wire Size	Area Cir. Mils	Ampacity	Wire Type
18	1620	6	Stranded only
16	2580	8	Stranded only
14	4110	15	Stranded or solid
12	6530	20	Stranded or solid
10	10380	30	Stranded or solid

(b) Circuit breakers or fuses shall be of an approved type, including automotive types. Fuseholders shall be clearly marked with maximum fuse size. For further information, see Society of Automotive Engineers (SAE) Standard J 554a-1973 and Underwriters' Laboratories, Inc. Standard 275B-1973.

(c) Higher current-consuming direct-current appliances such as pumps, compressors, heater blowers, and similar motor-driven appliances shall be installed in accordance with the manufacturer's instructions.

(d) The overcurrent protective device shall be installed in an accessible location on the commercial coach as close as practical to the point where the power supply connects to the vehicle circuits. If located outside the commercial coach, the device shall be protected against weather and physical damage.

(6) Switches shall be rated at not less than the connected load.

[Statutory Authority: RCW 43.22.340. 82-04-060 (Order 82-4), § 296-150B-557, filed 2/2/82.]

**WAC 296-150B-560 Wiring materials--Combination electrical systems.** (1) General. Vehicle wiring suitable for connection to a battery or direct current supply source shall be permitted to be connected to a 115-volt source if the entire wiring system and equipment are rated and installed in full conformity with requirements of this section covering 115-volt electrical systems. Circuits fed from alternating current transformers shall not supply direct current appliances.

(2) Voltage converters (115-volt alternating current to low-voltage direct current). The 115-volt alternating

current side of voltage converters, other than those supplied as an integral part of a listed appliance, shall be wired in full conformity with the provisions of this section for 115-volt electrical systems. All converters and transformers shall be listed and shall be used within their marked electrical ratings.

(3) Dual-voltage fixtures or appliances. Fixtures or appliances having both 115-volt and low-voltage connections shall be listed or approved for dual voltage.

(4) Autotransformers shall not be used.

(5) Receptacles and plug caps. When a commercial coach is equipped with a 120-volt or 120/240-volt alternating current system and a low-voltage system, receptacles and plug caps of the low-voltage system shall differ in configuration from those of the 120- or 120/240-volt system.

(6) Identification. When a commercial coach equipped with a battery or direct current system has an external connection for low-voltage power, the receptacle shall have a configuration that will not accept 120-volt power. The commercial coach shall have permanently affixed on the outside wall adjacent to the point of entrance of the power supply conductors a label that reads:

THIS CONNECTION IS FOR LOW-VOLTAGE BATTERY OR DIRECT CURRENT ONLY. DO NOT CONNECT TO 120 OR 240 VOLTS AC.

[Statutory Authority: RCW 43.22.340. 82-04-060 (Order 82-4), § 296-150B-560, filed 2/2/82.]

**WAC 296-150B-563 Generator installations--Mounting.** (1) Generators shall be mounted in such a manner as to be effectively bonded to the commercial coach chassis.

(2) Generator protection. Equipment shall be installed to ensure that the generator is disconnected when the vehicle is energized from an outside source and to ensure that the outside source is disconnected when the vehicle is energized by the generator. The generator field shall be protected by appropriately rated, listed equipment.

(3) Installation of generators. Internal combustion driven generator units (subject to the provisions of this chapter) shall be secured in place to avoid displacement from vibration and road shock and shall be installed in a compartment that is vaportight to the interior of the vehicle. (See WAC 296-150B-557(4) for battery installations.)

(4) Ventilation of generator compartments. Compartments accommodating internal combustion driven generator units shall be provided with approved ventilation in accordance with instructions provided by the manufacturer of the generator unit.

(5) Location of internal combustion engine generator exhaust. Exhaust from generator internal combustion engines shall not terminate within 3 feet of the commercial coach gasoline tank filler spout inlet.

(6) Supply conductors. Supply conductors from the generator(s) to the junction box (having a blank cover) on the compartment wall shall be of the stranded type installed in flexible conduit.

[Statutory Authority: RCW 43.22.340. 82-04-060 (Order 82-4), § 296-150B-563, filed 2/2/82.]

**WAC 296-150B-567 Branch circuit and feeder calculations.** Branch circuit and feeder calculations shall be determined in accordance with Article 220 of the National Electrical Code.

[Statutory Authority: RCW 43.22.340. 82-04-060 (Order 82-4), § 296-150B-567, filed 2/2/82.]

**WAC 296-150B-570 Disconnecting means and branch circuit protective equipment—General.** (1) The branch circuit equipment shall be permitted to be combined with the disconnecting means as a single assembly. Such a combination shall be permitted to be designated as a distribution panelboard. If a fused distribution panelboard is used, the maximum fuse size for the mains shall be plainly marked with lettering at least 1/4-inch high and visible when fuses are changed.

See Article 110-22 of the National Electrical Code concerning identification of each disconnecting means and each service, feeder or branch circuit at the point where it originated and type marking needed.

(2) Plug fuses and fuseholders shall be tamper-resistant, Type "S," enclosed in dead-front fuse panelboards.

(3) Disconnecting means. A single disconnecting means shall be provided in each commercial coach consisting of a circuit breaker or a switch and fuses and their accessories installed in a readily accessible location near the point of entrance of the supply cord or conductors into the commercial coach. The main circuit breakers or fuses shall be plainly marked "main." This equipment shall contain a solderless type of grounding connector or bar for the purposes of grounding with sufficient terminals for all grounding conductors. The neutral bar termination of the grounded circuit conductors shall be insulated.

(4) The disconnecting equipment shall have a rating suitable for the connected load. The distribution equipment, either circuit breaker or fused type, shall be located a minimum of 24 inches from the bottom of such equipment to the floor level of the commercial coach. The main circuit breakers or switches shall be plainly marked "main." There shall be a label attached to the panelboard stating:

This Panelboard shall be connected by a Feeder Assembly having Overcurrent Protection rated at not more than ----- Amperes.

The correct ampere rating shall be marked in the blank space.

(5) Branch circuit distribution equipment shall be installed in each commercial coach and shall include overcurrent protection for each branch circuit consisting of either circuit breakers or fuses.

(6) The branch circuit overcurrent devices shall be rated:

(a) Not more than the circuit conductors; and

(b) not more than 150 percent of the rating of a single appliance rated ten amperes or more; but

(c) not more than the overcurrent protection rating marked on the motor operated appliance.

A device not approved for branch circuit protection, such as a thermal cutout or motor overload protective device, shall not be considered as the overcurrent device protecting the circuit.

(7) A 20-ampere fuse or circuit breaker shall be considered adequate protection for fixture leads, cords for portable appliances and No. 14 AWG (American Wire Gauge) tap conductors, not over six feet long, for recessed lighting fixtures.

(8) If more than one outlet or load is on a branch circuit, a 15-ampere receptacle shall be considered protected by a 20-ampere fuse or circuit breaker.

(9) When circuit breakers are provided for branch circuit protection, 240-volt circuits shall be protected by two-pole common or companion trip circuit breakers.

[Statutory Authority: RCW 43.22.340. 82-04-060 (Order 82-4), § 296-150B-570, filed 2/2/82.]

**WAC 296-150B-573 Power supply—Feeder assembly equipment.** A commercial coach shall be provided with feeder assembly equipment, installed by the manufacturer in accordance with the National Electrical Code and the provisions of this chapter. The assembly shall consist of either:

(1) One overhead assembly containing the required number of insulated color-coded feeder conductors, one of which shall be a grounding conductor; or

(2) One undervehicle assembly consisting of conduit running from the commercial coach branch circuit panelboard to the underside of the commercial coach. Conduit shall be sized in accordance with the National Electrical Code; or

(3) Other installations approved by the department.

[Statutory Authority: RCW 43.22.340. 82-04-060 (Order 82-4), § 296-150B-573, filed 2/2/82.]

**WAC 296-150B-577 Identification of feeder assembly connection.** (1) Each commercial coach equipped with a 120-volt electrical system shall have permanently affixed on the outside wall adjacent to the point of entrance of the feeder assembly, a label that reads:

THIS CONNECTION IS FOR 110-125 VOLT AC SERVICE.  
DO NOT CONNECT HIGHER VOLTAGE.

(2) Each commercial coach equipped with a 120/240-volt AC electrical system shall have permanently affixed on the outside wall, adjacent to the point of entrance of the supply assembly or permanently installed feeders, a label that reads:

THIS CONNECTION IS FOR 120/240 VOLT AC -----  
AMPERE SERVICE.

The correct service rating shall be stamped in the blank space.

(3) Each commercial coach equipped with a 480/277-volt electrical system shall have permanently affixed on the outside wall, adjacent to the point of entrance of the supply assembly or permanently installed feeders, a label that reads:

THIS CONNECTION IS FOR 480/277 VOLT AC -----  
AMPERE SERVICE.

The correct service rating shall be stamped in the blank space.

[Statutory Authority: RCW 43.22.340. 82-04-060 (Order 82-4), § 296-150B-577, filed 2/2/82.]

**WAC 296-150B-580 Wiring methods--Wiring of expandable or multiple units.** (1) Where circuits in expandable or multiple units are designed to be energized from one main panelboard, permanent-type wiring methods and materials shall be used for connecting the units to each other.

(2) Commercial coaches may have individual branch circuit panelboards installed in each unit subject to the requirements of WAC 296-150B-570, 296-150B-573 and 296-150B-577 of this chapter.

[Statutory Authority: RCW 43.22.340. 82-04-060 (Order 82-4), § 296-150B-580, filed 2/2/82.]

**WAC 296-150B-583 Under-chassis wiring.** Outdoor or under-chassis wiring (120/240 volts) exposed to moisture and mechanical damage shall be protected by rigid metal conduit, electrical metallic tubing or liquid-tight flexible metal conduit. The conductors shall be NMC, RW, TW or equivalent, subject to the requirements of WAC 296-150B-550.

[Statutory Authority: RCW 43.22.340. 82-04-060 (Order 82-4), § 296-150B-583, filed 2/2/82.]

**WAC 296-150B-587 Rodent resistance.** All exterior openings around wiring, conduit, cable boxes, and equipment shall be sealed to resist the entrance of rodents.

[Statutory Authority: RCW 43.22.340. 82-04-060 (Order 82-4), § 296-150B-587, filed 2/2/82.]

**WAC 296-150B-590 Electrical equipment--Lighting fixtures.** Combustible walls or ceiling finish, exposed between the edge of a fixture, canopy, or pan and an outlet box shall be covered with noncombustible material.

[Statutory Authority: RCW 43.22.340. 82-04-060 (Order 82-4), § 296-150B-590, filed 2/2/82.]

**WAC 296-150B-593 Equipment mounting.** Electrical equipment shall be securely mounted to prevent displacement during transit.

[Statutory Authority: RCW 43.22.340. 82-04-060 (Order 82-4), § 296-150B-593, filed 2/2/82.]

**WAC 296-150B-597 Outdoor outlets, fixtures, air cooling equipment, etc.** (1) Outdoor fixtures and equipment shall be listed for outdoor use. Outdoor receptacle or convenience outlets shall be of a gasketed-cover type for use in wet locations. A disconnecting means shall be located in sight of the equipment.

(2) A commercial coach designed to energize heating and/or air-conditioning equipment located outside the

commercial coach shall have permanently affixed, adjacent to the point of connection, a label that reads:

"THIS CONNECTION IS FOR ----- PHASE AIR-CONDITIONING EQUIPMENT RATED AT NOT MORE THAN ----- AMPERES, AT ----- VOLTS, 60 HERTZ."

The correct voltage and ampere rating shall be given.

[Statutory Authority: RCW 43.22.340. 82-04-060 (Order 82-4), § 296-150B-597, filed 2/2/82.]

**WAC 296-150B-600 Grounding--General.** Grounding of both electrical and nonelectrical metal parts in a commercial coach shall be through connection to a grounding bus in the commercial coach distribution panel. The grounding bus shall be grounded through the green-colored conductor in the supply cord or the feeder wiring to the service ground in the service-entrance equipment located adjacent to the commercial coach location. Neither the frame of the commercial coach nor the frame of any appliance shall be connected to the neutral conductor in the commercial coach.

(1) Insulated neutral.

(a) The grounded circuit conductor (neutral) shall be insulated from the grounding conductors and from equipment enclosures and other grounded parts. The grounded (neutral) circuit terminals in the distribution panels and in ranges, clothes dryers, counter-mounted cooking units and wall-mounted ovens shall be insulated from the equipment enclosure. Bonding screws, straps or buses in the distribution panel or in appliances shall be removed and discarded.

(b) Connections of ranges and clothes dryers with 115/230 v, 3-wire ratings shall be made with 4-conductor cord and 3-pole, 4-wire grounding-type plugs or by Type AC metalclad cable or individual conductors enclosed in flexible metal conduit.

Type NM or Type SE cable shall not be used to connect a range or a dryer. This shall not prohibit the use of Type NM or Type SE cable between the branch circuit overcurrent protective device and a junction box or range or dryer receptacle.

For 115-v rated devices, a 3-conductor cord and 2-pole, 3-wire grounding-type plug shall be permitted.

(2) Equipment grounding means.

(a) The green-colored grounding wire in the supply cord or permanent feeder wiring shall be connected to the grounding bus in the distribution panel or disconnecting means.

(b) In the electrical system, all exposed metal parts, enclosures, frames, lamp fixture canopies, etc., shall be effectively bonded to the grounding terminal or enclosure of the distribution panel.

(c) Cord-connected appliances shall be grounded by means of an approved cord with grounding conductor and grounding-type attachment plug.

(3) Bonding of noncurrent-carrying metal parts.

(a) All exposed noncurrent-carrying metal parts that may become energized shall be effectively bonded to the

grounding terminal or enclosure of the distribution panelboard. A bonding conductor shall be connected between each distribution panelboard and an accessible terminal on the chassis.

(b) Grounding terminals shall be of the solderless type and approved as pressure-terminal connectors recognized for the wire size used. The bonding conductor shall be solid or stranded, insulated or bare and shall be No. 8 copper minimum or equal. The bonding conductor shall be routed so as not to be exposed to physical damage.

(c) Metallic gas, water and waste pipes and metallic air circulating ducts shall be considered bonded if they are connected to the terminal on the chassis (see (3)(a) of this section) by clamps, solderless connectors or by suitable grounding-type straps.

(d) Any metallic roof and exterior covering shall be considered bonded if (i) the metal panels overlap one another and are securely attached to the wood or metal frame parts by metallic fasteners, and (ii) if the lower panel of the metallic exterior covering is secured by metallic fasteners at a cross-member of the chassis by two metal straps per commercial coach unit or section at opposite ends.

[Statutory Authority: RCW 43.22.340. 82-04-060 (Order 82-4), § 296-150B-600, filed 2/2/82.]

**WAC 296-150B-603 Switch and receptacle plates.** Metallic faceplates shall be used only with grounding-type devices or grounded metallic outlet boxes.

[Statutory Authority: RCW 43.22.340. 82-04-060 (Order 82-4), § 296-150B-603, filed 2/2/82.]

**WAC 296-150B-607 Dielectric strength test.** (1) The wiring of each commercial coach shall be subjected to a 1-minute, 900-volt, dielectric strength test (with all switches closed) between live parts (including neutral) and the commercial coach ground. Alternatively, the test may be performed at 1,080 volts for 1 second. This test shall be performed after branch circuits are complete and after fixtures or appliances are installed. However, fixtures and appliances that are listed shall not be required to withstand the dielectric strength test.

(2) Each commercial coach designed with a 480-volt electrical system shall be subjected to a one-minute 1,275-volt dielectric strength test between current-carrying conductors and the coach ground. Alternatively, the test may be performed at 1,500 volts for one second.

(3) Low-voltage circuit conductors in each commercial coach shall withstand the applied potential without electrical breakdown of a one-minute, 500-volt or a one-second, 600-volt dielectric strength test. The potential shall be applied between live and grounded conductors.

The test may be performed on running light circuits before the lights are installed provided the vehicle's outer covering and interior cabinetry has been secured. The braking circuit may be tested before being connected to the brakes provided the wiring has been completely secured.

[Statutory Authority: RCW 43.22.340. 82-04-060 (Order 82-4), § 296-150B-607, filed 2/2/82.]

[Title 296 WAC—p 1890]

**WAC 296-150B-610 Mechanical--General.** Mechanical equipment and installations in or on a commercial coach shall be installed in accordance with the requirements of this chapter and the conditions of the mechanical equipment approval or listing. The provisions of this chapter are also applicable to the alteration or conversion of mechanical equipment and installations in any commercial coach bearing or required to bear a department insignia of approval.

[Statutory Authority: RCW 43.22.340. 82-04-060 (Order 82-4), § 296-150B-610, filed 2/2/82.]

**WAC 296-150B-613 Mechanical--Definitions.** The following definitions shall apply to this chapter.

(1) Absorber (adsorber) means that part of the low side of an absorption system used for absorbing (adsorbing) vapor refrigerant.

(2) Absorption system means a refrigerating system in which the gas evolved in the evaporator is taken up by an absorber or adsorber.

(3) Absorption unit means a factory-built assembly designed to produce refrigeration for comfort cooling or comfort heating by the application of heat.

(a) A direct absorption unit is a unit in which the refrigerant evaporator is in direct contact with the air to be conditioned.

(b) An indirect absorption unit is a unit in which the refrigerant evaporator is not in direct contact with the air to be conditioned.

(4) Accessible means when applied to a fixture, connection, appliance, or equipment, having access thereto but which may require the removal of an access panel, door, or similar obstruction.

(5) Air-conditioning or comfort-cooling equipment means equipment intended or installed to treat air to control its temperature, humidity, cleanliness, or distribution to meet the requirements of the conditioned space.

(6) Air-handling unit means a blower or fan used to distribute conditioned air to a room or space.

(7) Anti-flooding device means a primary safety control which causes the liquid fuel flow to be shut off upon a rise in fuel level or upon receiving excess fuel, and that operates before a hazardous discharge of fuel can occur.

(8) Appliance compartment means a room having a floor area not in excess of twice the largest plan area of the appliance or appliances contained therein plus the clearances required in this chapter.

(9) Automatic pilot device means a device employed with gas-burning equipment that will either automatically shut off the gas supply to the burner being served or automatically actuate, electrically or otherwise, a gas shut-off device when the pilot flame is extinguished.

(10) Automatic pump (oil lifter) means a pump, not an integral part of the oil-burning appliance, that automatically pumps oil from the supply tank and delivers the oil by gravity under a constant head to an oil-burning appliance.

(11) Btu means British Thermal Unit, which is the quantity of heat required to raise the temperature of one pound of water one degree Fahrenheit.

- (12) Btuh means British Thermal Units per Hour.
- (13) Burner means a device for the final conveyance of fuel or a mixture of fuel and air to the combustion zone.
- (14) Chimney, factory-built means a chimney consisting entirely of factory-made parts, each designed to be assembled with the others without requiring field construction.
- (15) Class O air ducts means a duct of materials and connectors having a fire-hazard classification of zero.
- (16) Class I air ducts means a duct of materials and connectors having a flame-spread rating of not over 25 without evidence of continued progressive combustion and a smoke-developed rating of not over 50.
- (17) Class II air ducts means a duct of materials and connectors having a flame-spread rating of not over 50 without evidence of continued progressive combustion and a smoke-developed rating of not over 50 for the inside surface and not over 100 for the outside surface.
- (18) Clearance means the distance between the appliance, chimney, vent, or chimney or vent connector or plenum and the nearest surface.
- (19) Combustible material means a material adjacent to or in contact with heat-producing appliances, vent connectors, chimneys, or steam and hot water pipes, made of or surfaced with wood, compressed paper, plant fibers, or other materials that will ignite and burn. Such material shall be considered combustible even though flameproofed, fire-retardant treated, or plastered.
- (20) Compressor means a specific machine, with or without accessories, for compressing a given refrigerant vapor.
- (21) Compressor unit means a condensing unit less the condenser and liquid receiver.
- (22) Condenser means a vessel or arrangement of pipe or tubing in which vaporized refrigerant is liquefied by the removal of heat.
- (23) Condensing unit means a specific refrigerating machine combination for a given refrigerant, consisting of one or more power-driven compressors, condensers, liquid receivers (when required), and the regularly furnished accessories.
- (24) Connector-gas appliance means a flexible or semi-rigid connector listed as conforming to ANSI Standard Z21.24, Metal Connectors for Gas Appliances, used to convey fuel gas, three feet or less in length (six feet or less for gas ranges), between a gas outlet and a gas appliance in the same room with the outlet.
- (25) Duct means a conduit or passageway for conveying air to or from heating, cooling, air conditioning, or ventilation equipment, but not including the plenum.
- (26) Evaporator means that part of the system in which liquid refrigerant is vaporized to produce refrigeration.
- (27) Expansion coil means an evaporator constructed of pipe or tubing.
- (28) Fuel gas piping system means the arrangement of piping, tubing, fittings, connectors, valves, and devices designed and intended to supply or control the flow of fuel gas to an appliance.
- (29) Fuel oil piping system means the arrangement of piping, tubing, fittings, connectors, valves, and devices designed and intended to supply or control the flow of fuel oil to an appliance.
- (30) Gas means fuel gas, such as natural gas, manufactured gas, undiluted liquefied petroleum gas (vapor phase only), liquefied petroleum air-gas mixtures, or mixtures of these gases that would ignite in the presence of oxygen.
- (31) Gas clothes dryer means a device used to dry wet laundry by means of heat derived from the combustion of fuel gases. Dryer classifications are as follows:
- (a) Type 1. Factory-built package, multiple produced. Primarily used in family living environment. May or may not be coin-operated for public use. Usually the smallest unit physically and in function output.
- (b) Type 2. Factory-built package, multiple produced. Used in business with direct intercourse of the function with the public. May or may not be operated by public or hired attendant. May or may not be coin-operated. Not designed for use in individual family living environment. May be small, medium or large in relative size.
- (32) Gas refrigeration means a gas-burning appliance that is designed to extract heat from a suitable chamber.
- (33) Gas-supply connection means the terminal end or connection to which a gas-supply connector is attached.
- (34) Gas vents means factory-built vent piping and vent fittings listed by an approved testing agency that are assembled and used in accordance with the terms of their listings, for conveying flue gases to the outside atmosphere.
- (a) Type-B gas vent. A gas vent for venting gas appliances with draft hoods and other gas appliances listed for use with Type-B gas vents.
- (b) Type-BW gas vent. A gas vent for venting listed gas-fired vented wall furnaces.
- (35) Heating appliance means an appliance for comfort heating of a commercial coach or for water heating.
- (36) Heat-producing appliance means all heating and cooking appliances and all fuel burning appliances.
- (37) High side means the parts of a refrigerating system under condenser pressure.
- (38) Input rating means the maximum fuel-burning capacity of any warm-air furnace, recessed heater, or burner expressed in British thermal units per hour.
- (39) Liquefied petroleum gases (LPG) means any material that is composed predominantly of propane, propylene, butanes (normal butane or isobutane), and butylenes, or any mixture of them.
- (40) Low side means the parts of a refrigerating system under evaporator pressure.
- (41) Plenum means an air compartment that is part of an air-distributing system to which one or more ducts are connected.
- (a) A furnace-supply plenum is a plenum attached directly to, or an integral part of, the air-supply outlet of the furnace.
- (b) A furnace-return plenum is a plenum attached directly to or an integral part of, the return inlet of the furnace.

(42) Quick-disconnect device means a hand-operated device that provides a means for connecting and disconnecting a gas supply or connecting gas systems and that is equipped with an automatic means to shut off the gas supply when the device is disconnected.

(43) Readily accessible means having direct access without the necessity of removing any panel, door, or similar obstruction.

(44) Refrigerant means a substance used to produce refrigeration by its expansion or vaporization.

(45) Refrigerating system means a combination of interconnected refrigerant-containing parts constituting one closed refrigerant circuit in which a refrigerant is circulated for the purpose of extracting heat.

(46) Roof jack means that portion of a commercial coach heater flue or vent assembly, including the cap, insulating means, flashing, and ceiling plate, located in and above the roof of a commercial coach.

(47) Sealed absorption system means a unit system for Group 2 refrigerants only in which all refrigerant-containing parts are made permanently tight by welding or brazing against refrigerant loss.

(48) Sealed combustion system appliance means an appliance that by its inherent design is constructed so that all air supplied for combustion, the combustion system of the appliance, and all products of combustion are completely isolated from the atmosphere of the space in which it is installed.

(49) Self-contained system means a complete factory-made and factory-tested system in a suitable frame or enclosure that is fabricated and shipped in one or more sections and in which no refrigerant-containing parts are connected in the field other than by companion or block valves.

(50) Unit system means a self-contained system that has been assembled and tested prior to its installation and that is installed without connecting any refrigerant-containing parts. A unit system may include factory-assembled companion or block valves.

(51) Vent connector means a pipe for conveying products of combustion from a fuel-burning appliance to a vent.

(52) Water heater means an appliance for heating water for domestic purposes other than for space heating.

[Statutory Authority: RCW 43.22.340. 82-04-060 (Order 82-4), § 296-150B-613, filed 2/2/82.]

**WAC 296-150B-617 LPG equipment and installations—Construction of containers.** Containers shall be constructed and marked in accordance with the specifications for LPG containers of the U.S. Department of Transportation (DOT) or the Rules for Construction of Unfired Pressure Vessels, Section VIII, Division 1, ASME Boiler and Pressure Vessel Code. ASME containers shall have a design pressure of not less than 312.5 psig.

(1) Container supply systems shall be arranged for vapor withdrawal only.

(2) Container openings for vapor withdrawal shall be located in the vapor space when the container is in service or shall be provided with a suitable internal withdrawal tube which communicates with the vapor space in or near the highest point in the container when it is mounted in service position, with the commercial coach on a level surface. Containers shall be permanently and legibly marked in a conspicuous manner on the outside to show the correct mounting position and the position of the service outlet connection. The method of mounting in place shall be such as to minimize the possibility of an incorrect positioning of the container.

[Statutory Authority: RCW 43.22.340. 82-04-060 (Order 82-4), § 296-150B-617, filed 2/2/82.]

**WAC 296-150B-620 Location of LPG containers and systems.** (1) LPG containers shall not be installed, nor shall provisions be made for installing or storing any LPG container, even temporarily, inside any commercial coach except for listed, completely self-contained hand torches, lanterns, or similar equipment with containers having a maximum water capacity of not more than 2 1/2 pounds (approximately one pound LPG capacity).

(2) Containers, control valves and regulating equipment, when installed, shall be mounted on the "A" frame of the commercial coach, or installed in a compartment that is vapor-tight to the inside of the commercial coach and accessible only from the outside. The compartment shall be ventilated at top and bottom to facilitate diffusion of vapors. The compartment shall be ventilated with two vents having an aggregate area of not less than two percent of the floor area of the compartment and shall open unrestricted to the outside atmosphere. The required vents shall be equally distributed between the floor and ceiling of the compartment. If the lower vent is located in the access door or wall, the bottom edge of the vent shall be flush with the floor level of the compartment. The top vent shall be located in the access door or wall with the bottom of the vent not more than 12 inches below the ceiling level of the compartment. All vents shall have an unrestricted discharge to the outside atmosphere. Access doors or panels of compartments shall not be equipped with locks or require special tools or knowledge to open.

(3) Permanent and removable fuel containers shall be securely mounted to prevent jarring loose, slipping, or rotating and the fastenings shall be designed and constructed to withstand static loading in any direction equal to twice the weight of the tank and attachments when filled with fuel, using a safety factor of not less than four based on the ultimate strength of the material to be used.

[Statutory Authority: RCW 43.22.340. 82-04-060 (Order 82-4), § 296-150B-620, filed 2/2/82.]

**WAC 296-150B-623 LPG container valves and accessories.** (1) Valves in the assembly of a two-cylinder system shall be arranged so that replacement of containers can be made without shutting off the flow of gas to the appliance. This provision is not to be construed as requiring an automatic change-over device.



(2) Shutoff valves on the containers shall be protected in transit, in storage, and while being moved into final use as follows:

(a) By setting into a recess of the container to prevent possibility of their being struck if container is dropped upon a flat surface, or,

(b) By ventilated cap or collar, fastened to the container, capable of withstanding a blow from any direction equivalent to that of a 30-pound weight dropped four feet. Construction shall be such that the blow will not be transmitted to the valve.

(3) Regulators shall be connected directly to the container shutoff valve outlets or mounted securely by means of a support bracket and connected to the container shutoff valve or valves with listed high-pressure connections. If the container is permanently mounted, the connector shall be as required above or with a listed semi-rigid tubing connector.

[Statutory Authority: RCW 43.22.340. 82-04-060 (Order 82-4), § 296-150B-623, filed 2/2/82.]

**WAC 296-150B-627 LPG safety devices.** (1) DOT containers shall be provided with safety-relief devices as required by the regulations of the U.S. Department of Transportation. ASME containers shall be provided with relief valves in accordance with Subsection 221 of the Standard for the Storage and Handling of Liquefied-Petroleum Gases (NFPA No. 58-1976). Safety-relief valves shall have direct communication with the vapor space of the vessel.

(2) The delivery side of the gas-pressure regulator shall be equipped with a safety-relief device set to a discharge at a pressure not less than two times and not more than three times the delivery pressure of the regulator.

(3) Systems mounted on the "A" frame assembly shall be so located that the discharge from the safety-relief devices shall be into the open air and not less than three feet horizontally from any opening into the commercial coach below the level of such discharge.

[Statutory Authority: RCW 43.22.340. 82-04-060 (Order 82-4), § 296-150B-627, filed 2/2/82.]

**WAC 296-150B-630 LPG system enclosure and mounting.** (1) Housings and enclosures shall be designed to provide proper ventilation at least equivalent to that specified in WAC 296-150B-620(2).

(2) Doors, hoods, domes, or portions of housings and enclosures required to be removed or opened for replacement of containers shall incorporate means for clamping them firmly in place and preventing them from working loose during transit.

(3) Provisions shall be incorporated in the assembly to hold the containers firmly in position and prevent their movement during transit.

(4) Containers shall be mounted on a substantial support or a base secured firmly to the commercial coach chassis. Neither the container nor its support shall extend below the commercial coach frame.

[Statutory Authority: RCW 43.22.340. 82-04-060 (Order 82-4), § 296-150B-630, filed 2/2/82.]

(1989 Ed.)

**WAC 296-150B-633 LPG system design and service line pressure.** Systems shall be of the vapor-withdrawal type. Gas, at a pressure not over 14 inches water column (1/2 psi) shall be delivered from the system into the gas supply connection.

[Statutory Authority: RCW 43.22.340. 82-04-060 (Order 82-4), § 296-150B-633, filed 2/2/82.]

**WAC 296-150B-637 Electrical equipment.** All electrical equipment installed in conjunction with gas equipment shall be listed for the purpose intended.

[Statutory Authority: RCW 43.22.340. 82-04-060 (Order 82-4), § 296-150B-637, filed 2/2/82.]

**WAC 296-150B-640 Gas piping systems--General.** The requirements of this section shall govern the installation of all fuel gas piping attached to any commercial coach. Gas delivered into the gas supply system shall be at a pressure not exceeding 14 inch water column (1/2 psi). None of the requirements listed in this section shall apply to the piping supplied as a part of an appliance.

[Statutory Authority: RCW 43.22.340. 82-04-060 (Order 82-4), § 296-150B-640, filed 2/2/82.]

**WAC 296-150B-643 Piping design.** Commercial coaches requiring fuel gas for any purpose shall be equipped with a gas-piping system that is designed for LPG only, combination LPG and natural gas, or natural gas.

[Statutory Authority: RCW 43.22.340. 82-04-060 (Order 82-4), § 296-150B-643, filed 2/2/82.]

**WAC 296-150B-647 Materials.** All materials used for the installation, extension, alteration, or repair of any gas-piping system shall be new and free from defects or internal obstructions. It shall not be permissible to repair defects in gas piping or fittings. Inferior or defective materials shall be removed and replaced with acceptable material. The system shall be made of materials having a melting point of not less than 1,450°F (789°C), except as provided in WAC 296-150B-670. They shall consist of one or more of the following materials:

(1) Steel or wrought-iron pipe shall comply with ANSI Standard B36.10-1975 for Wrought-Steel and Wrought-Iron Pipe. Threaded brass pipe in iron pipe sizes may be used.

(2) Fittings for gas piping shall be wrought iron, malleable iron, steel or brass (containing not more than 75 percent copper).

(3) Copper tubing shall be annealed type, Grade K or L, conforming to the Specifications for Seamless Copper Water Tube (ASTM B88-76), or shall comply with the Specifications for Seamless Copper Tube for Air Conditioning and Refrigeration Field Service, ASTM B280-76. When used on systems designed for natural gas, such tubing shall be internally tinned.

(4) Steel tubing shall have a minimum wall thickness of 0.032 inch for tubing of 1/2 inch diameter and smaller and 0.049 inch for diameters 1/2 inch and larger. Steel tubing shall be constructed in accordance with ASTM Specification for Electric-Resistance-

[Title 296 WAC—p 1893]



Welded Coiled Steel Tubing for Gas and Fuel Oil Lines (ASTM A539-73), and shall be externally corrosion protected.

[Statutory Authority: RCW 43.22.340. 82-04-060 (Order 82-4), § 296-150B-647, filed 2/2/82.]

**WAC 296-150B-650 Expandable or multiple commercial coaches.** Where gas piping is to be installed in more than one portion of an expandable or multiple commercial coach, the design and construction shall be as follows:

(1) There shall be only one point of crossover which shall be readily accessible from the exterior of the commercial coach.

(2) The connector between units shall be a listed flexible connector for exterior use, sized in accordance with WAC 296-150B-653.

(3) Protective caps or plugs shall be permanently attached to the coach by means of a metal chain and used to seal the system when not in use.

[Statutory Authority: RCW 43.22.340. 82-04-060 (Order 82-4), § 296-150B-650, filed 2/2/82.]

**WAC 296-150B-653 System sizing--Gas pipe sizing.** Gas piping systems shall be sized so that the pressure drop to any appliance inlet connection from any gas supply connection, when all appliances are in operation at maximum capacity, is not more than 0.5 inch water column as determined on the basis of test or in accordance with WAC 296-150B-667. The natural gas supply connection shall be not less than the size of the gas piping but shall be not smaller than 3/4 inch nominal pipe size.

[Statutory Authority: RCW 43.22.340. 82-04-060 (Order 82-4), § 296-150B-653, filed 2/2/82.]

**WAC 296-150B-657 Sizing and capacity of gas piping.** In order to determine the size of piping to be used in designing a gas piping system, the following factors must be considered:

(1) Allowable loss in pressure from the commercial coach gas supply connection to appliance.

(2) Maximum gas consumption to be provided.

(3) Length of piping.

(4) Type of gas.

[Statutory Authority: RCW 43.22.340. 82-04-060 (Order 82-4), § 296-150B-657, filed 2/2/82.]

**WAC 296-150B-660 Description of tables.** (1) The quantity of gas to be provided at each outlet shall be determined directly from the manufacturer's Btu input rating of the appliance that will be installed.

(2) Capacities for combustion of LPG and natural gas at low pressures (0.5 psig or less) in thousands of Btu per hour for different sizes and lengths are shown in the table in WAC 296-150B-667 for iron pipe or equivalent rigid pipe and for semi-rigid tubing. WAC 296-150B-667 is based upon a pressure drop of 0.5 inch water column. In using the table, no additional allowance is necessary for an ordinary number of fittings.

[Title 296 WAC—p 1894]

(3) Capacities in thousands of Btu per hour of undiluted liquefied petroleum gases based on a pressure drop of 0.5 inch water column for different sizes and lengths are shown in the table in WAC 296-150B-667 for iron pipe or equivalent rigid pipe and for semi-rigid tubing. In using this table, no additional allowance is necessary for an ordinary number of fittings.

(4) For any gas piping system, for special gas appliances or for conditions other than those covered by WAC 296-150B-667, such as longer runs, greater gas demands or greater pressure drops, the size of each gas piping system shall be determined by standard engineering methods acceptable to the department.

[Statutory Authority: RCW 43.22.340. 82-04-060 (Order 82-4), § 296-150B-660, filed 2/2/82.]

**WAC 296-150B-663 Use of capacity tables.** To determine the size of each section of gas piping in a system within the range of the capacity tables, proceed as follows:

(1) Determine the gas demand of each appliance to be attached to the piping system. When the table in WAC 296-150B-667 is to be used to select the piping size, calculate the gas demand in terms of thousands of Btu for each piping system outlet.

(2) Measure the length of piping from the gas supply connection to the most remote outlet in the commercial coach.

(3) In the appropriate capacity table, select the column showing the measured length or the next longer length if the table does not give the exact length. This is the only length used in determining the size of any section of gas piping.

(4) Use this same vertical column to locate ALL gas demand figures for this particular system of piping.

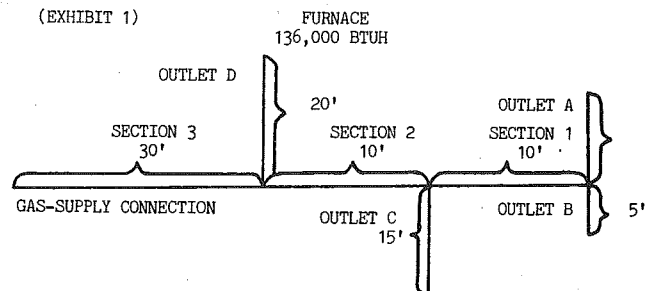
(5) Starting at the most remote outlet, find in the vertical column just selected the gas demand for that outlet. If the exact figure or demand is not shown, choose the next larger figure below in the column.

(6) Opposite this demand figure, in the first column at the left, will be found the correct size of gas piping.

(7) Proceed in a similar manner for each outlet and each section of gas piping. For each section of piping, determine the total gas demand supplied by that section.

— Example of piping system design:

Determine the required pipe size of each section and outlet of the piping system, with a designated pressure drop of 0.5 inch water column.



(1989 Ed.)

OUTLET A	WATER HEATER	30,000 BTUH
OUTLET B	REFRIGERATOR	3,000 BTUH
OUTLET C	RANGE	73,000 BTUH
OUTLET D	FURNACE	136,000 BTUH

**SOLUTION:**

(1) The length of pipe from the gas supply inlet to the most remote outlet (A) is 60 feet. This is the only distance used.

(2) Using the column marked 60 feet in the table:

Outlet A, supplying 30,000 BTUH, requires 3/8" iron pipe.

Outlet B, supplying 3,000 BTUH, requires 1/4" iron pipe.

Section 1, supplying outlets A and B, or 33,000 BTUH, requires 3/8" iron pipe.

Outlet C, supplying 73,000 BTUH, requires 3/4" iron pipe.

Section 2, supplying outlets A, B and C, or 106,000 BTUH, requires 3/4" iron pipe.

Outlet D, supplying 136,000 BTUH, requires 3/4" iron pipe.

Gas Supply Connection, Section 3, supplying outlets A, B, C and D, or 242,000 BTUH, requires 1" iron pipe.

[Statutory Authority: RCW 43.22.340. 82-04-060 (Order 82-4), § 296-150B-663, filed 2/2/82.]

**WAC 296-150B-667 Table--Iron pipe and tubing sizes.**

**PART I**

Maximum Capacity of Different Sizes of Pipe and Tubing in Thousands of Btu's Per Hour of Natural Gas For Gas Pressures of 0.5 Psig or Less and a Maximum Pressure Drop of 1/2 Inch Water Column

**PART I(A)**

Iron Pipe Sizes										
Length in Feet										
I.D.	10	20	30	40	50	60	70	80	90	100
1/4"	43	29	24	20	18	16	15	14	13	12
3/8"	95	65	52	45	40	36	33	31	29	27
1/2"	175	120	97	82	73	66	61	57	53	50
3/4"	360	250	200	170	151	138	125	118	110	103
1"	680	465	375	320	285	260	240	220	215	195

**PART I(B)**

Tubing										
Length in Feet										
O.D.	10	20	30	40	50	60	70	80	90	100
3/8"	27	18	15	13	11	10	9	9	8	8
1/2"	56	38	31	26	23	21	19	18	17	16
5/8"	113	78	62	53	47	43	39	37	34	33
3/4"	197	136	109	93	83	75	69	64	60	57
7/8"	280	193	155	132	117	106	98	91	85	81

**PART II**

Maximum Capacity of Different Sizes of Pipe and Tubing in Thousands of BTU's Per Hour of Undiluted Liquefied Petroleum Gas Based on a Maximum Pressure Drop of 1/2 Inch Water Column

**PART II(A)**

Iron Pipe Sizes										
Length in Feet										
I.D.	10	20	30	40	50	60	70	80	90	100
1/4"	67	46	37	31	28	25	23	21	20	19
3/8"	147	101	81	70	62	56	51	48	45	42
1/2"	275	189	152	129	114	103	96	89	83	78
3/4"	567	393	315	267	237	217	196	185	173	162
1"	1071	732	590	504	448	409	378	346	322	307

**PART II(B)**

Tubing										
Length in Feet										
O.D.	10	20	30	40	50	60	70	80	90	100
3/8"	39	26	21	19	—	—	—	—	—	—
1/2"	92	62	50	41	37	35	31	29	27	26
5/8"	199	131	107	90	79	72	67	62	59	55
3/4"	329	216	181	145	131	121	112	104	95	90
7/8"	501	346	277	233	198	187	164	155	146	138

[Statutory Authority: RCW 43.22.340. 82-04-060 (Order 82-4), § 296-150B-667, filed 2/2/82.]

**WAC 296-150B-670 Joints and installation--Joints for gas pipe.** All pipe joints in the piping system, unless welded or brazed, shall be threaded joints that comply with ANSI Standard Pipe Threads (Except Dryseal) B2.1-1968. Right and left nipples or couplings shall not be used. Unions, if used, shall be of ground joint type. The material used for welding or brazing pipe connections shall have a melting temperature in excess of 1,000°F (537°C).

[Statutory Authority: RCW 43.22.340. 82-04-060 (Order 82-4), § 296-150B-670, filed 2/2/82.]

**WAC 296-150B-673 Joints in gas tubing systems.** Tubing joints shall be made with either a single or double flare of the proper degree, as recommended by the tubing manufacturer, by means of listed gas tubing fittings, or by being brazed with material having a melting point exceeding 1,000°F (537°C).

[Statutory Authority: RCW 43.22.340. 82-04-060 (Order 82-4), § 296-150B-673, filed 2/2/82.]

**WAC 296-150B-677 Concealed tubing.** Tubing shall not be run inside walls, floors, partitions, or roofs. Where tubing passes through walls, floors, partitions,

roofs, or similar installations, the tubing shall be protected by the use of weather resistant grommets that snugly fit both the tubing and the hole through which the tubing passes.

[Statutory Authority: RCW 43.22.340. 82-04-060 (Order 82-4), § 296-150B-677, filed 2/2/82.]

**WAC 296-150B-680 Pipe-joint compound.** Screw joints shall be made tight with listed pipe-joint compound that is insoluble in liquefied petroleum gas. The pipe-joint compound shall be applied to the male threads only.

[Statutory Authority: RCW 43.22.340. 82-04-060 (Order 82-4), § 296-150B-680, filed 2/2/82.]

**WAC 296-150B-683 Concealed joints.** Piping or tubing joints shall not be located in any floor, wall partition, or similar concealed construction space.

[Statutory Authority: RCW 43.22.340. 82-04-060 (Order 82-4), § 296-150B-683, filed 2/2/82.]

**WAC 296-150B-687 Hangers and supports.** All gas piping shall be adequately supported by galvanized or equivalently protected metal straps or hangers at intervals of not more than four feet, except where adequate support and protection is provided by structural members. Solid-iron pipe gas-supply connections shall be rigidly anchored to a structural member within six inches of the supply connections.

[Statutory Authority: RCW 43.22.340. 82-04-060 (Order 82-4), § 296-150B-687, filed 2/2/82.]

**WAC 296-150B-690 Electrical ground.** Gas piping shall not be used for an electrical ground.

[Statutory Authority: RCW 43.22.340. 82-04-060 (Order 82-4), § 296-150B-690, filed 2/2/82.]

**WAC 296-150B-693 Identification of gas supply connections.** A label shall be permanently attached on the outside of the exterior wall of the commercial coach adjacent to the gas supply connection which reads (as appropriate) either:

**LP-Gas System**

This gas piping system is designed for use of liquefied petroleum gas only.

DO NOT CONNECT NATURAL GAS TO THIS SYSTEM.

CONTAINER SHUTOFF VALVES SHALL BE  
CLOSED DURING TRANSIT.

When connecting to lot outlet, use a listed gas supply connector for vehicles rated at

- 100,000 Btuh  
or more  
 250,000 Btuh

Before turning on gas, make certain all gas connections have been made tight, all appliance valves are turned off, and any unconnected outlets are capped.

After turning on gas, test gas piping and connections to appliances for leakage with soapy water or bubble solution, and light all pilots.

or

**Combination LP-Gas and Natural Gas System**

This gas piping system is designed for use of either liquefied petroleum gas or natural gas.

NOTICE: BEFORE TURNING ON GAS, BE CERTAIN APPLIANCES ARE DESIGNED FOR THE GAS CONNECTED AND ARE EQUIPPED WITH CORRECT ORIFICES. SECURELY CAP THIS INLET WHEN NOT CONNECTED FOR USE.

When connecting to lot outlet, use a listed gas supply connector for vehicles rated at

- 100,000 Btuh  
or more  
 250,000 Btuh

Before turning on gas, make certain all gas connections have been made tight, all appliance valves are turned off, and any unconnected outlets are capped.

After turning on gas, test gas piping and connections to appliances for leakage with soapy water or bubble solution, and light all pilots.

The appropriate Btuh input rating shall be marked.

[Statutory Authority: RCW 43.22.340. 82-04-060 (Order 82-4), § 296-150B-693, filed 2/2/82.]

**WAC 296-150B-697 Gas piping system openings.** All openings in the gas piping system shall be closed gas-tight with threaded pipe plugs or pipe caps.

[Statutory Authority: RCW 43.22.340. 82-04-060 (Order 82-4), § 296-150B-697, filed 2/2/82.]

**WAC 296-150B-700 Appliance connections.** All interior gas-burning appliances shall be connected to the gas piping system with materials as provided in WAC 296-150B-647 or with listed gas appliance connectors. Listed appliance connectors, if used, shall not be run through walls, floors, ceilings, or partitions. Listed appliance connectors shall also not be run through cabinets or cupboards unless protected or positioned to minimize mechanical damage. Where a listed connector is used, only one connector may be used to serve a single appliance. Connectors with aluminum exterior surfaces shall not be used outdoors.

[Statutory Authority: RCW 43.22.340. 82-04-060 (Order 82-4), § 296-150B-700, filed 2/2/82.]

**WAC 296-150B-703 Valves.** (1) A shutoff valve shall be installed in the fuel piping outside of each gas appliance but inside the commercial coach structure, and upstream of the union or connector, in addition to any valve on the appliance. The shutoff valve shall be located within 6 feet of a cooking appliance and within 3 feet of any other appliance. A shutoff valve may serve more than one appliance if located as required above.

(2) Shutoff valves used in connection with gas piping shall be of a type designed and listed for use on LPG.

[Statutory Authority: RCW 43.22.340. 82-04-060 (Order 82-4), § 296-150B-703, filed 2/2/82.]

**WAC 296-150B-707 Testing for leakage—Before appliances are connected.** The piping system shall stand a pressure of at least six inches mercury or three PSI gage for a period of not less than ten minutes without showing any drop in pressure. Pressure shall be measured with a mercury manometer or slope gage calibrated so as to be read in increments of not greater than one-tenth pound or an equivalent device. The source of pressure shall be isolated before the pressure tests are made. Before a test is begun, the temperature of the ambient air and of the piping shall be approximately the same and constant air temperature shall be maintained throughout the test.

[Statutory Authority: RCW 43.22.340. 82-04-060 (Order 82-4), § 296-150B-707, filed 2/2/82.]

**WAC 296-150B-710 After appliances are connected.** After gas appliances have been connected, the gas-piping system shall be subjected to a pressure test with the burner valves closed. The test shall consist of air at not less than ten inches nor more than 14 inches pressure of water column (six to eight ounces), the system shall hold this pressure for a period of not less than 10 minutes with no perceptible leakage. Before beginning the test, the temperature of the gas-piping system and the test air shall be equalized and maintained throughout the test.

Appliance shut-off valves ahead of listed gas cooking appliances may be closed for the performance of this test. When the test is satisfactorily performed in this manner, these valves shall be opened and, while the system is under pressure, the appliance connectors shall be tested with an approved leak detector or approved bubble solution.

[Statutory Authority: RCW 43.22.340. 82-04-060 (Order 82-4), § 296-150B-710, filed 2/2/82.]

**WAC 296-150B-713 Rodent resistance.** All exterior openings around piping, ducts, plenums, or vents shall be sealed to resist the entrance of rodents.

[Statutory Authority: RCW 43.22.340. 82-04-060 (Order 82-4), § 296-150B-713, filed 2/2/82.]

**WAC 296-150B-717 Oil piping systems—General.** The requirements of this section shall govern the installation of all liquid fuel piping attached to any commercial coach. None of the requirements listed in this section shall apply to the piping in the appliances.

[Statutory Authority: RCW 43.22.340. 82-04-060 (Order 82-4), § 296-150B-717, filed 2/2/82.]

**WAC 296-150B-720 Oil piping systems—Expandable or multiple commercial coaches.** When a commercial coach is composed of two or more units or includes expandable rooms, the oil-piping system shall be located only in the unit containing the oil-supply connection.

(1989 Ed.)

[Statutory Authority: RCW 43.22.340. 82-04-060 (Order 82-4), § 296-150B-720, filed 2/2/82.]

**WAC 296-150B-723 Oil piping systems—Materials.** All materials used for the installation, extension, alteration, or repair of any oil piping system shall be new and free from defects or internal obstructions. The system shall be made of materials having a melting point of not less than 1,450°F (789°C), except as provided in WAC 296-150B-730. They shall consist of one or more of the following materials:

(1) Steel or wrought-iron pipe shall comply with American National Standard for Wrought-Steel or Wrought-Iron Pipe, B36.10-1975. Threaded copper or brass pipe in iron pipe sizes may be used.

(2) Fittings for oil piping shall be wrought iron, malleable iron, steel, or brass (containing not more than 75 percent copper).

(3) Copper tubing shall be annealed type, Grade K or L, conforming to the Specifications for Seamless Copper Water Tube (ASTM B88-76); or shall comply with the specifications for Seamless Copper Tube for Air Conditioning and Refrigeration Field Service, ASTM B280-76.

(4) Steel tubing shall have a minimum wall thickness of 0.032 inch for diameters up to 1/2 inch and 0.049 inch for diameters of 1/2 inch and larger. Steel tubing shall be constructed in accordance with the Specification for Electric-Resistance Welded Coiled Steel Tubing for Gas and Fuel Oil Lines (ASTM A539-73) and shall be externally corrosion protected.

[Statutory Authority: RCW 43.22.340. 82-04-060 (Order 82-4), § 296-150B-723, filed 2/2/82.]

**WAC 296-150B-727 Oil piping systems—Size of oil piping.** The minimum size of all fuel-oil tank piping connecting outside tanks to the appliance shall be no smaller than three-eighth-inch OD copper tubing or one-fourth-inch ips. If No. 1 fuel oil is used with a listed automatic pump (fuel lifter), copper tubing shall be sized as specified by the pump manufacturer.

[Statutory Authority: RCW 43.22.340. 82-04-060 (Order 82-4), § 296-150B-727, filed 2/2/82.]

**WAC 296-150B-730 Oil piping systems—Joints for oil piping.** All pipe joints in the piping system, unless welded or brazed, shall be threaded joints which comply with American National Standard for Pipe Threads (Except Dryseal), B2.1-1968. The material used for brazing pipe connections shall have a melting temperature in excess of 1,000°F (537°C).

[Statutory Authority: RCW 43.22.340. 82-04-060 (Order 82-4), § 296-150B-730, filed 2/2/82.]

**WAC 296-150B-733 Oil piping systems—Tubing joints.** Tubing joints shall be made with either a single or double flare of the proper degree, as recommended by the tubing manufacturer, by means of listed tubing fittings or brazed with material having a melting point exceeding 1,000°F (537°C).

[Statutory Authority: RCW 43.22.340. 82-04-060 (Order 82-4), § 296-150B-733, filed 2/2/82.]

**WAC 296-150B-737 Oil piping systems--Pipe-joint compound.** Threaded joints shall be made tight with listed pipe joint compound which shall be applied to the male threads only.

[Statutory Authority: RCW 43.22.340. 82-04-060 (Order 82-4), § 296-150B-737, filed 2/2/82.]

**WAC 296-150B-740 Oil piping systems--Couplings.** Pipe couplings and unions shall be used to join sections of threaded pipe. Right and left nipples or couplings shall not be used.

[Statutory Authority: RCW 43.22.340. 82-04-060 (Order 82-4), § 296-150B-740, filed 2/2/82.]

**WAC 296-150B-743 Oil piping systems--Grade of piping.** Fuel oil piping installed in conjunction with gravity feed systems to oil heating equipment shall slope in a gradual rise upward from a central location to both the oil tank and the appliance in order to eliminate air locks.

[Statutory Authority: RCW 43.22.340. 82-04-060 (Order 82-4), § 296-150B-743, filed 2/2/82.]

**WAC 296-150B-747 Oil piping systems--Strap hangers.** All oil piping shall be adequately supported by galvanized or equivalently protected metal straps or hangers at intervals of not more than 4 feet, except where adequate support and protection is provided by structural members. Solid-iron-pipe oil supply connections shall be rigidly anchored to a structural member within 6 inches of the supply connections.

[Statutory Authority: RCW 43.22.340. 82-04-060 (Order 82-4), § 296-150B-747, filed 2/2/82.]

**WAC 296-150B-750 Oil piping systems--Testing for leakage.** Before setting the system in operation, tank installations and piping shall be checked for oil leaks with fuel oil of the same grade that will be burned in the appliance. No other material shall be used for testing fuel oil tanks and piping. Tanks shall be filled to maximum capacity for the final check for oil leakage.

[Statutory Authority: RCW 43.22.340. 82-04-060 (Order 82-4), § 296-150B-750, filed 2/2/82.]

**WAC 296-150B-753 Appliances--Heat-producing. General.**

(1) Heat-producing appliances and vents, roof jacks, and chimneys necessary for their installations in commercial coaches shall be listed or certified by a nationally recognized testing agency for use in mobile homes or commercial coaches. Air conditioning units and combination air conditioning and heating units shall be listed or certified by a nationally recognized testing agency for the application for which the unit is intended.

(2) Fuel-burning heat-producing appliances and refrigeration appliances, except ranges and ovens, shall be of the vented type and vented to the outside.

(3) Fuel-burning appliances shall not be converted from one fuel to another fuel unless converted in accordance with the terms of their listing and the appliance manufacturer's instructions.

(4) Gas-fired absorption comfort-cooling units shall meet all the requirements of American National Standard for Gas-Fired Absorption Summer Air Conditioning Appliances (ANSI Z21.40.1-1973).

(5) Mechanical comfort-cooling units shall meet all the requirements of the Standard for Unitary Air-Conditioning Equipment (ARI Standard 210-74).

(6) Direct refrigerating systems serving any air conditioning or comfort-cooling system installed in a commercial coach shall employ a type of refrigerant that ranks no lower than Group 5 in the Underwriters' Laboratories, Inc. "Classification of Comparative Life Hazard of Various Chemicals."

[Statutory Authority: RCW 43.22.340. 82-04-060 (Order 82-4), § 296-150B-753, filed 2/2/82.]

**WAC 296-150B-757 Appliances--Installation. (1)** The installation of each appliance shall conform to the terms of its listing and the manufacturer's instructions. The installer shall leave the manufacturer's instructions attached to the appliance. Every appliance shall be secured in place to avoid displacement.

(2) All fuel-burning appliances, except ranges, ovens, illuminating appliances, clothes dryers, solid fuel-burning fireplaces and solid fuel-burning fireplace stoves, shall be installed to provide for the complete separation of the combustion system from the interior atmosphere of the commercial coach. Combustion air inlets and flue gas outlets shall be listed or certified as components of the appliance. The required separation may be obtained by:

(a) The installation of direct vent system (sealed combustion system) appliances, or

(b) The installation of appliances within enclosures so as to separate the appliance combustion system and venting system from the interior atmosphere of the commercial coach. There shall not be any door, removable access panel or other opening into the enclosure from the inside of the commercial coach. Any opening for ducts, piping, wiring, etc., shall be sealed.

(3) A forced air appliance and its return-air system shall be designed and installed so that negative pressure created by the air-circulating fan cannot affect its or another appliance's combustion air supply or act to mix products of combustion with circulating air.

(4) The air circulating fan of a furnace installed in an enclosure with another fuel-burning appliance shall be operable only when any door or panel covering an opening in the furnace fan compartment or in a return air plenum or duct is in the closed position. This subsection does not apply if both appliances are direct vent system (sealed combustion system) appliances.

(5) If a warm air appliance is installed within an enclosure to conform to subsection (2)(b), each warm-air outlet and each return air inlet shall extend to the exterior of the enclosure. Ducts, if used for that purpose, shall not have any opening within the enclosure and shall end at a location exterior to the enclosure.

(6) Cooling coils installed as a portion of, or in connection with, any forced-air furnace shall be installed on

the downstream side unless the furnace is specifically otherwise listed.

(a) A cooling coil shall not be located in the air discharge duct or plenum of any forced-air furnace unless such furnace is listed for use with a cooling coil or listed for operation at not less than 0.5 inch water column external static pressure.

(b) If a cooling coil is installed within a forced-air furnace, the coil shall be listed for use with that furnace in the manner so installed or be approved for such use.

[Statutory Authority: RCW 43.22.340. 82-04-060 (Order 82-4), § 296-150B-757, filed 2/2/82.]

**WAC 296-150B-760 Appliances--Venting, ventilation, and combustion air.** (1) The venting required by WAC 296-150B-753(2) shall be accomplished by:

(a) An integral vent system listed or certified as part of the appliance; or

(b) a venting system consisting entirely of listed components, including a roof jack, installed in accordance with the terms of the appliance listing and the appliance manufacturer's instructions (see WAC 296-150B-757(2)).

(2) Venting and combustion air systems shall be installed in accordance with the following:

(a) Components shall be securely assembled and properly aligned using the method shown in the appliance manufacturer's instructions.

(b) Draft hood connectors shall be firmly attached to draft hood outlets or flue collars by sheet metal screws or by an equivalent means.

(c) Every joint of a vent, vent connector, exhaust duct, and combustion air intake shall be secure and in alignment.

(3) Venting systems shall not terminate underneath a commercial coach.

(4) Venting system terminations shall be not less than three feet from any motor-driven air intake discharging into habitable areas.

(5) The area in which cooking appliances are located shall be ventilated by a metal duct which may be single wall, not less than 12.5 square inches in cross-sectional area (minimum dimension shall be two inches) located above the appliances and terminating outside the commercial coach, or by listed mechanical ventilating equipment that is installed in accordance with the terms of listing and the manufacturer's instructions. Gravity or mechanical ventilation shall be installed within a horizontal distance of not more than ten feet from the vertical front of the appliances.

[Statutory Authority: RCW 43.22.340. 82-04-060 (Order 82-4), § 296-150B-760, filed 2/2/82.]

**WAC 296-150B-763 Appliances--Clearance-general.** (1) Information on clearances, input rating, lighting, and shut-down shall be attached to the appliances with the same permanence as the nameplate and so located that it is easily readable when the appliance is properly installed.

(1989 Ed.)

(2) Each fuel-burning appliance shall bear permanent marking designating the types of fuel for which it is listed.

(3) Every appliance shall be accessible for inspection, service, repair, and replacement without removing permanent construction. Sufficient room shall be available to enable the operator to observe the burner, control, and ignition means while starting the appliance.

(4) Heat-producing appliances shall be so located that no doors, drapes, or other such material can be placed or swung closer to the front of the appliance than the clearances specified on the labeled appliances.

(5) Clearances between heat-producing appliances and adjacent surfaces shall not be less than specified in the terms of their listing. Clearance spaces shall be framed in or guarded to prevent creation of storage space.

(6) Operating instructions shall be provided with appliances.

[Statutory Authority: RCW 43.22.340. 82-04-060 (Order 82-4), § 296-150B-763, filed 2/2/82.]

**WAC 296-150B-767 Safety devices--Water heater relief valves.** (1) All water heaters shall be installed with approved and listed fully automatic valve or valves designed to provide temperature and pressure relief.

(2) Any temperature relief valve or combined pressure and temperature relief valve installed for this purpose shall have the temperature sensing element immersed in the hottest water within the upper 6 inches of the tank. It shall be set to start relieving at a pressure of 150 psi or the rated working pressure of the tank, whichever is lower, and at or below a water temperature of 210°F.

(3) Relief valves shall be provided with full-sized drains that shall be directed downward and shall discharge beneath the commercial coach. Drain lines shall be of a material listed for hot water distribution and shall drain fully by gravity, shall not be trapped, and shall not have their outlets threaded.

[Statutory Authority: RCW 43.22.340. 82-04-060 (Order 82-4), § 296-150B-767, filed 2/2/82.]

**WAC 296-150B-770 Air duct material for circulating air supply system.** Supply ducts shall be made from galvanized steel, tin-plated steel, or aluminum, or shall be listed Class 0, Class 1, or Class 2 air ducts. Class 2 air ducts shall be located at least 3 feet from the furnace bonnet or plenum. A duct system integral with the structure shall be of durable construction that can be demonstrated to be equally resistant to fire and deterioration. Ducts constructed from sheet metal shall be in accordance with Table H-3.

Class 1 air ducts shall have a flame-spread rating of not over 25 without evidence of continual progressive combustion and a smoke-developed rating of not over 50. Class 2 air ducts shall have a flame-spread rating of not over 50 without evidence of continued progressive combustion and a smoke-developed rating of not over 50 for the inside surface material and not over 100 for the outside surface material.

[Title 296 WAC--p 1899]

Minimum Metal Thickness for Ducts\*

Duct Type	Diameter or 14 inches or less	Width over 14 inches
Round . . . . .	0.013 in.	0.016 in.
Enclosed Rectangular . . . . .	0.013 in.	0.016 in.
Exposed Rectangular . . . . .	0.016 in.	0.019 in.

\*When "nominal" thicknesses are specified, 0.003 inch shall be added to these "minimum" metal thicknesses.

[Statutory Authority: RCW 43.22.340. 82-04-060 (Order 82-4), § 296-150B-770, filed 2/2/82.]

**WAC 296-150B-773 Sizing of air ducts.** Ducts shall be designed so that when a labeled forced-air furnace is installed and operated continually at its normal input rating in the commercial coach, with all registers in full open position, the static pressure measured in the duct plenum shall not exceed that shown in the table in WAC 296-150B-777 or exceed that shown on the label of the appliance. When an air-cooler coil is installed between the furnace and the duct plenum, the total static pressure between the furnace and the coil shall not exceed that shown on the label of the furnace. The minimum dimension of any branch duct shall be at least 1 1/2 inches, and of any main duct, 2 1/2 inches.

[Statutory Authority: RCW 43.22.340. 82-04-060 (Order 82-4), § 296-150B-773, filed 2/2/82.]

**WAC 296-150B-777 Airtightness of air supply duct systems.** An air supply duct system shall be considered substantially airtight when the static pressure in the duct system, with all registers sealed and with the furnace air circulator at high speed, is at least 80 percent of the static pressure measured in the furnace casing, with its outlets sealed and the furnace air circulator operating at high speed. For the purpose of this section and WAC 296-150B-783, pressures shall be measured with a water manometer or equivalent device calibrated to read in increments not greater than 1/10 inch water column.

Maximum Allowable Static Pressures in Supply Duct Systems

Input to Forced-Air Furnace Btu/hr.	External Static Pressure Inches Water Column Measured at the Furnace Outlet	
	Temperature of Outlet Air Determined by Function of Limit Control	
	Above 165°F	165°F or Less
55,000 and under	0.10	0.20
Over 55,000 to 80,000	0.12	0.24
Over 80,000 to 100,000	0.15	0.30

[Statutory Authority: RCW 43.22.340. 82-04-060 (Order 82-4), § 296-150B-777, filed 2/2/82.]

**WAC 296-150B-780 Air ducts—Expandable or multiple commercial coach connections.** (1) An expandable or multiple commercial coach may have ducts of the heating system installed in the various units. The points of connection must be so designed and constructed that when the commercial coach is fully expanded or coupled, the resulting duct joint will conform to the requirements of this chapter.

(2) Installation instructions for supporting the cross-over duct from the commercial coach shall be provided for onsite installation. The duct shall not be in contact with the ground.

[Statutory Authority: RCW 43.22.340. 82-04-060 (Order 82-4), § 296-150B-780, filed 2/2/82.]

**WAC 296-150B-783 Air ducts—Return air systems.** Provisions shall be made to permit the return of circulating air from all rooms and living spaces except toilet rooms, to the circulating air supply inlet of the furnace.

(1) Duct material. Return ducts and any diverting dampers contained therein shall be in accordance with the following:

(a) Portions of return ducts directly above the heating surfaces or closer than 2 feet from the outer jacket or casing of the furnace shall be constructed of metal in accordance with the table in WAC 296-150B-770 or shall be listed Class 0 or Class 1 air ducts.

(b) Return ducts, except as required by (1)(a), shall be constructed of one-inch (nominal) wood boards (flame-spread classification of not more than 200), other suitable material no more flammable than one-inch board, or in accordance with the table in WAC 296-150B-770.

(c) The interior of combustible ducts shall be lined with noncombustible material at points where there might be danger from incandescent particles dropped through the register or furnace such as directly under floor registers and the bottom of vertical ducts or directly under furnaces having a bottom return.

(2) The cross-sectional area of the return air duct shall not be less than 2 square inches for each 1,000 Btu per hour input rating of the appliance. Dampers shall not be placed in any return air duct, except that a diverting damper may be placed in a combination fresh air intake and return air duct so arranged that the required cross-sectional area will not be reduced at all possible positions of the damper.

(3) Permanent uncloseable openings. Living areas not served by return air ducts or closed off from the return opening of the furnace by doors, sliding partitions, or other means shall be provided with permanent uncloseable openings in the doors or separating partitions to allow circulated air to return to the furnace. The openings may be grilled or louvered. The net free area of each opening shall be not less than 1 square inch for every 5 square feet of total living area closed off from the



furnace by the door or partition serviced by that opening. Undercutting doors connecting the closed-off space may be used as a means of providing return air area. However, in the event that doors are undercut, they shall be undercut a minimum of 2 inches and no more than 2 1/2 inches and no more than one-half of the free air area so provided shall be counted as return air area.

[Statutory Authority: RCW 43.22.340. 82-04-060 (Order 82-4), § 296-150B-783, filed 2/2/82.]

**WAC 296-150B-787 Air ducts--Joints and seams.** Joints and seams of ducts shall be securely fastened and made substantially airtight. Slip joints shall have a lap of at least 1 inch and shall be individually fastened. Tape or caulking compound may be used for sealing mechanically secure joints. Where used, tape or caulking compound shall not be subject to deterioration under long exposures to temperatures up to 200°F and to conditions of high humidity, excessive moisture, or mildew. Ducts shall be securely supported.

[Statutory Authority: RCW 43.22.340. 82-04-060 (Order 82-4), § 296-150B-787, filed 2/2/82.]

**WAC 296-150B-790 Air ducts--Registers or grills.** Fittings connecting the registers or grills to the duct system shall be constructed of metal or material that complies with the requirements of Class 1 or 2 ducts under Underwriters' Laboratories, Inc. Standard for Air Ducts, UL181-1974. Registers or grills shall be constructed of metal or conform with the following:

(1) Be made of a material classified 94VE-0 or 94VE-1 when tested as described in Underwriters' Laboratories, Inc. Standard for Tests for Flammability of Plastic Materials for Parts in Devices and Appliances, UL94-1976.

(2) Floor register or grills shall resist without structural failure a 200 lb. concentrated load on a 2-inch diameter disc applied to the most critical area of the exposed face of the register or grill. For this test the register or grill is to be at a temperature of not less than 165°F. and is to be supported in accordance with the manufacturer's instructions.

[Statutory Authority: RCW 43.22.340. 82-04-060 (Order 82-4), § 296-150B-790, filed 2/2/82.]

**WAC 296-150B-793 Air ducts--Duct and plenum insulation.** Every heating and cooling duct and plenum shall be installed in accordance with the following:

(1) Air supply ducts that are not within the coach insulation having a thermal insulation (R) factor of at least 4 shall be insulated.

(2) Supply ducts within the coach but not within the insulation described in subsection (1) shall be insulated with rigid insulation having a thermal insulation (R) factor not less than 3 with a continuous vapor barrier having a perm rating of not more than 1.0.

(3) Supply ducts exposed directly to outside air, such as under chassis crossover ducts, shall be insulated with material having a thermal insulation (R) of not less than 4.0 with a continuous vapor barrier having a perm rating of not less than 1.0.

(4) Aluminum foil used as a vapor barrier shall be at least 2 mils in thickness.

[Statutory Authority: RCW 43.22.340. 82-04-060 (Order 82-4), § 296-150B-793, filed 2/2/82.]

**WAC 296-150B-797 Plumbing--Definitions.** Definitions contained in the Uniform Plumbing Code, as adopted by the state building code council, and the following definitions shall apply to this chapter:

(1) Drain outlet means the discharge end of the commercial coach main drain to which a drain connector may be attached.

(2) Main drain means the principal artery of the commercial coach drainage system to which drainage branches may be connected.

(3) Uniform Plumbing Code (UPC) means the current edition, as published by the International Association of Plumbing and Mechanical Officials, and adopted by the state building code council.

(4) Water-supply connection means the fitting or point of connection of the commercial coach water distribution system designed for connection to a water connector.

[Statutory Authority: RCW 43.22.340 through 43.22.445. 86-21-136 (Order 86-32), § 296-150B-797, filed 10/22/86. Statutory Authority: RCW 43.22.340. 82-04-060 (Order 82-4), § 296-150B-797, filed 2/2/82.]

**WAC 296-150B-800 Plumbing--General.** Plumbing fixtures, equipment, and installations in commercial coaches shall conform to the provisions of the Uniform Plumbing Code, as adopted by the state building code council, except Part 1, unless specifically exempted or required by this section. The provisions of this chapter are also applicable to the alteration or conversion of plumbing equipment and installations in any commercial coach bearing or required to bear a department insignia of approval.

[Statutory Authority: RCW 43.22.340 through 43.22.445. 86-21-136 (Order 86-32), § 296-150B-800, filed 10/22/86. Statutory Authority: RCW 43.22.340. 82-04-060 (Order 82-4), § 296-150B-800, filed 2/2/82.]

**WAC 296-150B-803 Plumbing--Location of water-supply connections.** (1) Each commercial coach equipped with a water distribution system shall have a water-supply connection that shall terminate within 18 inches of the outside wall of the commercial coach.

(2) Water-supply connections shall be equipped with a watertight cap or plug that shall be permanently attached to the vehicle.

[Statutory Authority: RCW 43.22.340. 82-04-060 (Order 82-4), § 296-150B-803, filed 2/2/82.]

**WAC 296-150B-807 Plumbing--Tub and shower enclosures.** Wall surfacing for tub and shower enclosures shall meet the following requirements:

(1) The wall covering material must have an exposed surface that is impervious to water; the substrate material must be resistant to deterioration from exposure to high humidity and temporary water leakage.

(a) The complete wall assembly, including the wall covering substrate, shall be capable of withstanding a uniform load of five pounds per square foot applied perpendicular to the surface. The deflection, under load, shall not exceed 1/180 of the height of the wall, for the assembly; or 1/240 the distance between framing members, for the wall covering substrate.

(b) Surface finish. The exposed surface must meet the minimum requirements of the American Hardboard Association PS59-73, Prefinished Hardboard Paneling, Class 1, as certified by the panel manufacturer.

(c) Size. The minimum thickness of the material shall be 1/8" nominal. The width shall be sufficient to give a continuous unbroken surface from corner to corner or the end of the tub in a corner installation. In an installation incorporating a shower, the unbroken surface must continue to a height of at least 6' above the floor of the shower.

(d) Type. The substrate material shall also meet the requirements of the appropriate standard:

(i) Hardboard shall be of high strength and water resistance to meet Commercial Standard CS-251-63 or AHA PS 58-73, either standard or tempered.

(ii) Softwood plywood must meet U.S. Product Standard P.S. 1-74, including exterior type glue line and grade A face veneer "suitable for painting."

(iii) Hardwood plywood must meet U.S. Product Standard P.S. 51-71 Type I glue line and sound grade face veneer.

(iv) Other materials not meeting subsections (d)(i), (d)(ii), or (d)(iii) above, shall meet the requirements of this chapter and the appropriate product standard, industry standard, commercial standard, or federal specification.

(2) Installation. The material must be installed in conformance with this chapter and the application instructions provided by the material manufacturer. In case of conflict, this chapter shall take precedence.

(a) Framing. Wood framing shall be spaced not more than 16" o.c. Blocking shall be 1" x 3" or equal, installed horizontally at height to match rim of the tub or shower pan. All corners shall have sufficient framing members for attachment of corner moldings.

(b) Fastening. All edges and ends of panel shall occur on framing members. Panels shall be applied to wood framing members using water resistant, nonhard setting adhesive. Adhesive shall be applied to the face of all framing members except locations where panel edges fall beneath applied moldings. Panels may also be applied over solid backing using an adhesive.

Fasteners, if necessary, shall be used only in locations where they will be covered by applied moldings and shall be used on not more than two adjacent edges. No other interior fasteners or fixtures, other than required functional plumbing fixtures, shall penetrate the face of the panel. Openings for these plumbing fixtures must be sealed with caulk.

(c) Corners and edges. All corners and edges must be caulked or sealed against moisture penetration. A

nonhard setting sealant material must be used with applied moldings. Fastening of moldings to framing shall not be greater than 6" o.c.

[Statutory Authority: RCW 43.22.340. 82-04-060 (Order 82-4), § 296-150B-807, filed 2/2/82.]

**WAC 296-150B-810 Drainage--Location of drain outlets.** (1) Each commercial coach equipped with plumbing fixtures or equipment shall have only one drain outlet, which shall terminate within 18 inches of the outside wall of the commercial coach.

(2) A multiple commercial coach may have more than one drain outlet when approved by the department.

[Statutory Authority: RCW 43.22.340. 82-04-060 (Order 82-4), § 296-150B-810, filed 2/2/82.]

**WAC 296-150B-813 Drainage--Cap or plug.** Drain outlets shall be equipped with a watertight cap or plug that shall be permanently attached to the vehicle.

[Statutory Authority: RCW 43.22.340. 82-04-060 (Order 82-4), § 296-150B-813, filed 2/2/82.]

**WAC 296-150B-817 Drainage--Clearance from drain outlet.** The drain outlet and couplers shall be provided with a minimum clearance of three inches in any direction from all parts of the structure or appurtenances and with not less than 18 inches unrestricted clearance directly in front of the drain outlet.

[Statutory Authority: RCW 43.22.340. 82-04-060 (Order 82-4), § 296-150B-817, filed 2/2/82.]

**WAC 296-150B-820 Drainage--Drainage systems materials.** Plastic drain-waste-vent piping shall be permitted for domestic sewage as defined in the Uniform Plumbing Code.

[Statutory Authority: RCW 43.22.340. 82-04-060 (Order 82-4), § 296-150B-820, filed 2/2/82.]

**WAC 296-150B-950 Hearing on grievances.** A person who is aggrieved by an order, notice, or decision of the department under this chapter may request a hearing. The request must be in writing and must describe briefly the cause of the grievance.

The director of the department may hear the matter, or may assign the hearing to his or her representative. The department shall notify the complainant of the time, date, and place for the hearing. The hearing shall be held no later than 30 days after the department receives the request for the hearing. If the complainant fails to appear at the scheduled hearing, the department may dismiss the matter.

Upon conclusion of the hearing, the director or his or her representative shall notify the petitioner in writing of his or her decision in the matter.

[Statutory Authority: RCW 43.22.340. 82-04-060 (Order 82-4), § 296-150B-950, filed 2/2/82.]

**WAC 296-150B-990 Fees.**

- |   |                                  |   |  |
|---|----------------------------------|---|--|
| (1) Initial manufacturer filing fee:  | \$ 25.00                         | (6)(a) Fee for inspections, examinations of design plans, and other technical services performed by the department; other than inspections, examinations, and services for a HUD-labeled mobile home before it is sold or leased to a consumer: | \$50.00 minimum plus \$25.00 for every half-hour or fraction of a half-hour over one hour.   |
| (2) Fees for application for design plan approval. The fees listed in this subsection cover the application filing fee and one hour of examination time. The applicant will be required to pay for examination time beyond the base hours pursuant to the fees set in subsection (6). |                                  | (b) Fee for inspections, examinations, and other technical services performed by the department for a HUD-labeled mobile home before it is sold or leased to a consumer:  | \$23.00 per floor for routine inspections; \$50.00 minimum plus \$25.00 for every half-hour or fraction of a half-hour over one hour for nonroutine inspections and reinspections. |
| (a) Fee for application for commercial coach, recreational vehicle, or component design plan approval:  | \$ 70.00                         |   |  |
| (b) Fees for resubmittals of a design plan for a commercial coach, recreational vehicle, or component:  | \$ 50.00                         |   |  |
| (3) Design plan renewal fees.   |                                  |   |  |
| (a) Renewal of an unexpired and unrevoked commercial coach or recreational vehicle design plan or related group of plans:   | \$ 30.00                         |   |  |
| (b) Renewal of an expired or revoked design plan:   | 100% of fee for new design plan. | (7) Insignia fees.  |  |
| (4) Fee for transfer of design plan approval to a different manufacturer:   | \$100.00                         | (a) For each recreational vehicle:  | \$ 20.00   |
| (5) Fee for filing a commercial coach, recreational vehicle, or component quality control manual:   | \$ 10.00                         | (b) For each single width commercial coach, or for the first section of a multiple section commercial coach:  | \$ 15.00   |
|   |                                  | (c) For each additional section of a multiple section commercial coach:   | \$ 10.00   |
|   |                                  | (d) For each service core:  | \$ 50.00   |
|   |                                  | (e) For each component other than a service core:   | \$ 10.00   |

- (f) For each reissuance of a mobile home, commercial coach, or recreational vehicle insignia: \$ 10.00
- (g) For each alteration insignia: \$ 25.00
- (8) Fee for each notification to a local enforcement agency: \$ 15.00
- (9) Travel fees and expenses. If a manufacturer or other person requests an inspection or other technical service outside the state, the manufacturer must prepay the travel expenses of the department's employees on an estimated basis to be corrected after the inspections are completed. The department will not charge for travel expenses incurred for inspections or other services performed in Washington. The expenses shall be calculated pursuant to the following list:

- (a) Surface travel, per mile: \$ .185
- (b) Air travel: Cost of air fare based on published rates.
- (c) Hourly charge for travel time: \$25.00 per half-hour or fraction of a half-hour.

- (d) Expenses: Expenses include, but are not limited to, car rental, parking lot charges, and personal expenses. Personal expenses, including food, lodging, and per diem, shall be calculated pursuant to the allowances and costs set by the Washington State Office of Financial Management.

- (10) Fee for change in manufacturer's or dealer's name, address, or ownership: \$ 15.00

[Statutory Authority: RCW 43.22.350, 85-05-027 (Order 85-2), § 296-150B-990, filed 2/15/85. Statutory Authority: RCW 43.22.350 and 43.22.440, 83-01-018 (Order 82-37), § 296-150B-990, filed 12/6/82. Statutory Authority: RCW 43.22.440, 43.22.475 and 43.22.480, 82-12-040 (Order 82-20), § 296-150B-990, filed 5/28/82. Statutory Authority: RCW 43.22.340, 82-09-053 (Order 82-13), § 296-150B-990, filed 4/16/82.]

### Chapter 296-155 WAC SAFETY STANDARDS FOR CONSTRUCTION WORK

Reviser's note: To simplify the organization of this lengthy chapter and to assist the user in locating the desired subject matter, the agency has divided this chapter into subchapters. Only the names of such subchapters are shown in this chapter digest; for a full listing of sections within subchapters refer to the appropriate subchapter digest preceding the text of such sections.

#### Subchapters

- Part A General safety and health provisions.  
(WAC 296-155-001 through 296-155-040)
- Part B-1 Occupational health and environmental control.  
(WAC 296-155-100 through 296-155-170)
- Part B-2 Asbestos, tremolite, anthophyllite, and actinolite.  
(WAC 296-155-175 through 296-155-193)
- Part C Personal protective and life saving equipment.  
(WAC 296-155-200 through 296-155-240)
- Part D Fire protection and prevention.  
(WAC 296-155-250 through 296-155-280)
- Part E Signs, signals, and barricades.  
(WAC 296-155-300 through 296-155-315)
- Part F Material handling, storage, use and disposal.  
(WAC 296-155-325 through 296-155-34920)
- Part G Tools—Hand and power.  
(WAC 296-155-350 through 296-155-375)
- Part H Welding and cutting.  
(WAC 296-155-400 through 296-155-420)
- Part I Electrical.  
(WAC 296-155-425 through 296-155-462)
- Part J Ladders, scaffolds and elevating work platforms.  
(WAC 296-155-475 through 296-155-48536)
- Part K Floor openings, wall openings and stairways.  
(WAC 296-155-500 through 296-155-515)
- Part L Cranes, derricks, hoists, elevators, and conveyors.  
(WAC 296-155-525 through 296-155-59920)

- Part M Motor vehicles, mechanized equipment, and marine operations.  
(WAC 296-155-600 through 296-155-630)
- Part N Excavation, trenching, and shoring.  
(WAC 296-155-650 through 296-155-66505)
- Part O Concrete, concrete forms and shoring.  
(WAC 296-155-675 through 296-155-699)
- Part P Steel erection.  
(WAC 296-155-700 through 296-155-720)
- Part Q Tunnels and shafts, caissons, cofferdams, and compressed air.  
(WAC 296-155-725 through 296-155-74501)
- Part R Miscellaneous construction requirements.  
(WAC 296-155-750 through 296-155-770)
- Part S Demolition.  
(WAC 296-155-775 through 296-155-830)
- Part T Refer to chapter 296-52 WAC, Safety standards for the possession, handling and use of explosives.  
(WAC 296-155-850 through 296-155-920 Repealed)
- Part U Power distribution and transmission lines. (Reserved)
- Part V Rollover protective structures and overhead protection.  
(WAC 296-155-950 through 296-155-965)

Reviser's note: Order 74-26, filed May 7, 1974, both repealed chapter 296-40 WAC, entitled "Safety standards—Construction work," and adopted this new chapter as a replacement. The effective date of this order is June 6, 1974.

**Part A**

**GENERAL SAFETY AND HEALTH PROVISIONS**

- WAC
- 296-155-001 Foreword.
- 296-155-003 Subsections, subdivisions, items, subitems, and segments.
- 296-155-005 Purpose and scope.
- 296-155-006 Equipment approval by nonstate agency or organization.
- 296-155-007 Incorporation of standards of national organization.
- 296-155-008 Incorporation of standards of federal agency.
- 296-155-009 Equipment whether or not owned by, or under control of the employer.
- 296-155-010 Variance and procedure.
- 296-155-012 Definitions applicable to all sections of this chapter.
- 296-155-015 Education and first-aid standards.
- 296-155-020 Housekeeping.
- 296-155-030 Acceptable certifications.
- 296-155-035 General requirements.
- 296-155-040 Safe place standards.

**WAC 296-155-001 Foreword.** (1) This chapter has been compiled with the purpose of consolidating all division of industrial safety and health construction safety standards into one chapter of the Washington Administrative Code, by the promulgation of the standards contained herein. It is also the intent that the safety standards of the Washington state department of labor and industries, will be at least as effective as those adopted by the U.S. Department of Labor and administered by the Occupational Safety and Health Administration as published in the Code of Federal Regulations. The division of industrial safety and health is incorporating many of the preexisting construction safety standards and adding new standards under this chapter.

(2) Attention is called to the fact that certain Washington state standards contain standards and/or regulations applicable to all industries. These include, but are not limited to: The code for boilers and pressure

vessels; the code for pressure piping; the general industrial safety and health standards; the general occupational health standards; regulations of the department of social and health services.

[Order 76-29, § 296-155-001, filed 9/30/76; Order 74-26, § 296-155-001, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-003 Subsections, subdivisions, items, subitems, and segments.** (1) That portion of section numeration appearing after the chapter designation appears in either a three digit or a five digit format (e.g. WAC 296-24-330 and 296-24-30002). The final two digits of the section number are implied decimal extensions of the first three digits and represent a further division of the three digit enumeration.

(2) Sections of this chapter may be divided into subsections (1), (2), (3), etc., which may in turn be divided into subdivisions (a), (b), (c), etc., which may be further divided into items (i), (ii), (iii), etc., which may be further divided into subitems (A), (B), (C), etc., which may be further divided into segments (aa) [(I)], (bb) [(II)], (cc) [(III)], etc., all according to the following hierarchy, e.g.

Sections	296-24-330 and 296-24-33002
Subsections	(1) (2)
Subdivisions	(a) (b)
Items	(i) (ii)
Subitems	(A) (B)
Segments	I II

Note: "Part" as used in this standard means a major division of this chapter relating to a specific topic or topics and containing various related sections.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-003, filed 1/21/86; Order 74-26, § 296-155-003, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-005 Purpose and scope.** (1) The standards included in this chapter apply throughout the state of Washington, to any and all work places subject to the Washington Industrial Safety and Health Act (chapter 49.17 RCW), where construction, alteration, demolition, related inspection, and/or maintenance and repair work, including painting and decorating, is performed. These standards are minimum safety requirements with which all industries must comply when engaged in the above listed types of work.

(2) If a provision of this chapter conflicts with a provision of the general safety and health standard (chapter 296-24 WAC) or the general occupational health standard (chapter 296-62 WAC), the provision of this chapter shall prevail. When a provision of this chapter

conflicts with a provision of another vertical safety standard applying to the place of work, the provisions of the vertical standard of specific application shall prevail.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-005, filed 1/21/86. Statutory Authority: RCW 49.17.040, 49.17.050, 49.17.240, chapters 42.30 and 43.22 RCW. 80-17-014 (Order 80-20), § 296-155-005, filed 11/13/80; Order 76-29, § 296-155-005, filed 9/30/76; Order 74-26, § 296-155-005, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-006 Equipment approval by nonstate agency or organization.** Whenever a provision of this chapter states that only that equipment or those processes approved by an agency or organization other than the department of labor and industries, such as the Underwriters Laboratories or the Bureau of Mines, shall be utilized, that provision shall be construed to mean that approval of such equipment or process by the designated agency or group shall be prima facie evidence of compliance with the provisions of this chapter.

[Order 74-26, § 296-155-006, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-007 Incorporation of standards of national organization.** Whenever a provision of this chapter incorporates by reference a national code or portion thereof which has been adopted by and is currently administered by another state agency, compliance with those provisions adopted and administered by such other state agency, if from a more recent edition of such national code, will be deemed to be prima facie evidence of compliance with the provisions of this chapter.

[Order 74-26, § 296-155-007, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-008 Incorporation of standards of federal agency.** (1) Whenever a provision of this chapter incorporates therein provisions of the Code of Federal Regulations (CFR) and changes thereto, or any other regulations adopted by an agency of the federal government, that provision of this chapter shall be construed to mean that compliance with such regulations shall be prima facie evidence of compliance with the provisions of this chapter.

(2) Whenever a provision of this chapter incorporates therein provisions of the Code of Federal Regulations, the provisions so incorporated shall be those in effect on the date of effectiveness of this chapter, unless the content of the incorporating section specifies otherwise.

[Order 76-29, § 296-155-008, filed 9/30/76; Order 74-26, § 296-155-008, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-009 Equipment whether or not owned by, or under control of the employer.** (1) It is the employer's responsibility to ensure that any defective equipment or tools are not used.

(2) When any tool or piece of equipment fails to meet the requirements of any safety standard or recognized safe practice, the tool or equipment shall not be used.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-009, filed 1/21/86.]

**WAC 296-155-010 Variance and procedure.** Realizing that conditions may exist in operations under

which certain state standards will not have practical application, the director of the department of labor and industries or his authorized representative may, pursuant to this section, sections eight or nine of the Washington Industrial Safety and Health Act (chapter 80, Laws of 1973, RCW 49.17.080 and 49.17.090) and appropriate administrative rules of this state and the department of labor and industries and upon receipt of application and after adequate investigation by the department, permit a variation from these requirements when other means of providing an equivalent measure of protection are afforded. Such variation granted shall be limited to the particular case or cases covered in the application for variance and may be revoked for cause. The order granting a variance shall be conspicuously posted on the premises and shall remain posted during the time it is in effect. A copy of the variance shall be available at the work site. All requests for variances from safety and health standards included in this chapter, shall be made in writing to the director of the department of labor and industries at Olympia, Washington, or his duly authorized representative, the assistant director, division of industrial safety and health, department of labor and industries, Olympia, Washington.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-010, filed 1/21/86; Order 74-26, § 296-155-010, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-012 Definitions applicable to all sections of this chapter.**

Note: Unless the context indicates otherwise, words used in this chapter shall have the meaning given in this section. Certain parts of this chapter contain definitions as they apply to that particular part.

(1) "Approved" means approved by the director of the department of labor and industries or his authorized representative: *Provided, however,* That should a provision of this chapter state that approval by an agency or organization other than the department of labor and industries is required, such as Underwriters' Laboratories or the bureau of mines, the provisions of WAC 296-155-006 shall apply.

(2) "Assistant director" means the individual in charge of the division of industrial safety and health, department of labor and industries, or an authorized representative.

(3) "Authorized person" means a person approved or assigned by the employer to perform a specific type of duty or duties or be at a specific location or locations at the workplace.

(4) "Competent person" means one who is capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt corrective action to eliminate them.

(5) "Confined or enclosed space" means any space having a limited means of egress, which is subject to the accumulation of toxic or flammable contaminants or has an oxygen deficient atmosphere. Confined or enclosed spaces include, but are not limited to, storage tanks,

process vessels, bins, boilers, ventilation or exhaust ducts, sewers, underground utility vaults, tunnels, pipe-lines, and open top spaces more than 4 feet in depth such as pits, tubs, vaults, and vessels.

(6) "Construction work" shall mean and include all or any part of excavation, construction, erection, alteration, repair, demolition, and dismantling, of buildings and other structures and all operations in connection therewith; the excavation, construction, alteration and repair of sewers, trenches, caissons, conduits, pipe lines, roads and all operations pertaining thereto; the moving of buildings and other structures, and to the construction, alteration, repair, or removal of wharfs, docks, bridges, culverts, trestles, piers, abutments or any other construction, alteration, repair or removal work related thereto.

(7) "Defect" means any characteristic or condition which tends to weaken or reduce the strength of the tool, object, or structure of which it is a part.

(8) "Department" means the department of labor and industries.

(9) "Designated person" means "authorized person" as defined in subsection (3) of this section.

(10) "Director" means the director of the department of labor and industries, or his designated representative.

(11) "Division" means the division of industrial safety and health of the department.

(12) "Employer" means any person, firm, corporation, partnership, business trust, legal representative, or other business entity which engages in any business, industry, profession, or activity in this state and employs one or more employees or who contracts with one or more persons, the essence of which is the personal labor of such person or persons and includes the state, counties, cities, and all municipal corporations, public corporations, political subdivisions of the state, and charitable organizations: *Provided*, that any person, partnership, or business entity not having employees, and who is covered by the industrial insurance act shall be considered both an employer and an employee.

(13) "Equipment" means all machinery, devices, tools, facilities, safeguards, and protective construction used in connection with construction operations.

(14) "Ground fault circuit interrupter" means a fast acting circuit breaker that is sensitive to very low levels of current leakage to ground. The device is designed to limit the electric shock to a current and time duration below that which can cause serious injury.

(15) "Hazard" means that condition, potential or inherent, which is likely to cause injury, death, or occupational disease.

(16) "Hazardous substance" means a substance which, by reason of being explosive, flammable, poisonous, corrosive, oxidizing, irritating, or otherwise harmful, is likely to cause death or injury.

(17) "Maintenance" means the work of keeping a building, machine, roadway, etc., in a state of good repair.

(18) "Part" means a major division, of this chapter, relating to a specific topic or topics and containing various sections, subsections, etc.

(19) "Qualified" means one who, by possession of a recognized degree, certificate, or professional standing, or who by extensive knowledge, training, and experience, has successfully demonstrated his ability to solve or resolve problems relating to the subject matter, the work, or the project.

(20) "Repair" means to restore a building, machine, roadway, etc., to an original state after damage or decay.

(21) "Safety factor" means the ratio of the ultimate breaking strength of a member or piece of material or equipment to the actual working stress or safe load when in use.

(22) "Safety and health standard" means a standard which requires the adoption or use of one or more practices, means, methods, operations, or processes reasonably necessary or appropriate to provide safe or healthful employment and places of employment.

(23) "Shall" means that the provision(s) of the standard are mandatory.

(24) "Substantial" means constructed of such strength, of such material, and of such workmanship, that the object referred to will withstand all normal wear, shock and usage.

(25) "Standard safeguard" means a device designed and constructed with the object of removing the hazard of accident incidental to the machine, appliance, tool, building, or equipment to which it is attached.

Standard safeguards shall be constructed of either metal or wood or other suitable material or a combination of these. The final determination of the sufficiency of any safeguard rests with the director of the department of labor and industries through the division of industrial safety and health.

(26) "Suitable" means that which fits, or has the qualities or qualifications to meet a given purpose, occasion, condition, function, or circumstance.

(27) "Working day" means a calendar day, except Saturdays, Sundays, and legal holidays as set forth in RCW 1.16.050, as now or hereafter amended, and for the purposes of the computation of time within which an act is to be done under the provisions of this chapter, shall be computed by excluding the first working day and including the last working day.

(28) "Worker," "personnel," "man," "person," "employee," and other terms of like meaning, unless the context of the provision containing such term indicates otherwise, mean an employee of an employer who is employed in the business of his employer whether by way of manual labor or otherwise and every person in this state who is engaged in the employment of or who is working under an independent contract the essence of which is his personal labor for an employer whether by manual labor or otherwise.

(29) "Work place" means any plant, yard, premises, room, or other place where an employee or employees are employed for the performance of labor or service over which the employer has the right of access or control, and includes, but is not limited to, all work places covered by industrial insurance under Title 51 RCW, as now or hereafter amended.



(30) Abbreviations used in this chapter:

(a) "ANSI" means American National Standards Institute.

(b) "API" means American Petroleum Institute.

(c) "ASA" means American Standards Association.

(d) "ASAE" means American Society of Agricultural Engineers.

(e) "ASHRE" means American Society of Heating and Refrigeration Engineers.

(f) "ASME" means American Society of Mechanical Engineers.

(g) "ASTM" means American Society of Testing and Materials.

(h) "AWS" means American Welding Society.

(i) "BTU" means British thermal unit.

(j) "BTUH" means British thermal unit per hour.

(k) "CFM" means cubic feet per minute.

(l) "CFR" means Code of Federal Register.

(m) "CGA" means Compressed Gas Association.

(n) "CIE" means Commission Internationale de l'Éclairage.

(o) "DOT" means department of transportation.

(p) "FRP" means fiberglass reinforced plastic.

(q) "GPM" means gallons per minute.

(r) "ICC" means Interstate Commerce Commission.

(s) "ID" means inside diameter.

(t) "LPG" means liquefied petroleum gas.

(31) Additional abbreviations used in this chapter:

(a) "MCA" means Manufacturing Chemist Association.

(b) "MSHA" means United States Department of Labor, Mine Safety and Health Administration.

(c) "NBFU" means National Board of Fire Underwriters.

(d) "NEMA" means National Electrical Manufacturing Association.

(e) "NFPA" means National Fire Protection Association.

(f) "NTP" means normal temperature and pressure.

(g) "OD" means outside diameter.

(h) "PSI" means pounds per square inch.

(i) "PSIA" means pounds per square inch absolute.

(j) "PSIG" means pounds per square inch gauge.

(k) "RMA" means Rubber Manufacturers Association.

(l) "SAE" means Society of Automotive Engineers.

(m) "TFI" means The Fertilizer Institute.

(n) "TSC" means Trailer Standard Code.

(o) "UL" means Underwriters' Laboratories, Inc.

(p) "USASI" means United States of America Standards Institute.

(q) "USC" means United States Code.

(r) "USCG" means United States Coast Guard.

(s) "WAC" means Washington Administrative Code.

(t) "WISHA" means Washington Industrial Safety and Health Act of 1973.

[Statutory Authority: RCW 49.17.040 and 49.17.050, 86-03-074 (Order 86-14), § 296-155-012, filed 1/21/86; Order 74-26, § 296-155-012, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-015 Education and first-aid standards.** It shall be the duty of every employer to comply with such standards and systems of education for safety as shall be, from time to time, prescribed for such employer by the director of labor and industries through the division of industrial safety and health or by statute. Refer to WAC 296-155-100 through 296-155-135 for additional requirements.

[Order 74-26, § 296-155-015, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-020 Housekeeping.** (1) All places of employment shall be kept clean to the extent that the nature of the work allows.

(2) To facilitate cleaning, every floor, working surface, and passageway shall be kept free from protruding nails, splinters, loose boards or openings.

(3) Cleaning and sweeping shall be performed in such a manner as to minimize the contamination of the air with dust.

(4) In areas where workers may pass or perform duties, all debris and accumulations of material shall be removed. Hoses and electrical conductors across aisles or passageways shall be covered or suspended overhead so that there is no tripping hazard.

(5) Where mechanical handling equipment is used, sufficient safe clearances shall be allowed for aisles, at loading docks, through doorways and wherever turns or passages must be made. Such aisles and passageways shall be marked.

(6) Storage of material shall not create a hazard. Bags, containers, bundles, construction materials and other equipment shall be stored in tiers, stacked, blocked or interlocked. They shall be limited in height so that they are stable and secure against falling, sliding, or collapse.

(7) Free access shall be maintained at all times to all exits, fire alarm boxes, fire extinguishing equipment, and any other emergency equipment. Free access means clear of all obstructions.

(8) Working and storage areas shall be kept free from accumulation of materials that pose hazards of tripping, fire, explosion, or pest harborage. Vegetation control shall be exercised.

(9) All lunchrooms, washrooms and restrooms shall be kept in a clean and sanitary condition. Garbage cans in lunchrooms and restrooms shall be equipped with fitted covers and the contents disposed of daily.

(10) During the course of construction, alteration, repair or demolition of buildings and structures, employers shall ensure continuous clean-up of their work area, including removal of all rubble, scrap, boxes, crates and excess material to trash disposal areas.

(11) Containers shall be provided for the collection and separation of waste, trash, oily or used rags, and other refuse. Containers used for garbage and other oily, flammable or hazardous wastes, such as caustics, acids, harmful dusts or similar materials shall be equipped with covers. Common garbage and other waste shall be disposed of at frequent and regular intervals. Chemical

agents or substances which might react to create a hazardous condition shall be stored and disposed of separately. All hazardous wastes which are subject to the requirements of chapter 173-303 WAC shall be handled, accumulated and disposed of in accordance with that chapter.

(12) All floors and walkways shall be maintained in good condition. Loose or broken components shall be repaired or replaced. Secure footing shall be ensured on all floors and walkways.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-020, filed 1/21/86; Order 74-26, § 296-155-020, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-030 Acceptable certifications.** (1) Pressure vessels. Current and valid certification by an insurance company or regulatory authority shall be deemed as acceptable evidence of safe installation, inspection, testing of pressure vessels provided by the employer.

(2) Boilers. Boilers provided by the employer shall be deemed to be in compliance with the requirements of this section when evidence of current and valid certification by an insurance company or regulatory authority attesting to the safe installation, inspection, and testing is presented.

(3) Other requirements. Regulations prescribing specific requirements for other types of pressure vessels and similar equipment are contained in Parts D and M of this chapter.

[Order 74-26, § 296-155-030, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-035 General requirements.** (1) The use of any machinery, tool, material, or equipment which is not in compliance with any applicable requirements of this chapter is prohibited. Such machine, tool, material, or equipment shall either be identified as unsafe by tagging or locking the controls to render them inoperable or shall be physically removed from its place of operation.

(2) The employer shall permit only those employees qualified by training or experience to operate equipment and machinery.

(3) Employees shall use safeguards provided for their protection.

(4) Suitable clothing shall be worn for the job. Sufficient and proper clothing shall be worn to assist in preventing scratches, abrasions, slivers, sunburn, hot liquid burns, or similar hazards. Loose or ragged clothing, scarfs or ties shall not be worn while working around moving machinery.

(5) Where work is in progress above workers, a catch platform or other means shall be provided to protect those working below. All workers shall be notified. One completed floor shall be maintained between workers and steel or concrete work above.

(6) Employees shall report to their employers the existence of any unsafe equipment or method or any other hazard which, to their knowledge is unsafe and where such unsafe equipment or method or other hazard exists in violation of this chapter it shall be corrected.

(7) Nothing herein contained shall prevent the use of existing equipment during its lifetime provided it shall be properly safeguarded, maintained in good condition, be in conformity with applicable safety and health standards, and shall conform to safety factors for the material used, as herein provided.

(8) As construction progresses, the component parts of structures shall be secured or braced to prevent collapse or failure.

(9) Prompt and safe removal of injured employees from elevated work locations, trenches and excavations shall be ensured prior to commencement of work.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-035, filed 1/21/86; Order 74-26, § 296-155-035, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-040 Safe place standards.** (1) Each employer shall furnish to each of his employees a place of employment free from recognized hazards that are causing or likely to cause serious injury or death to his employees.

(2) Every employer shall require safety devices, furnish safeguards, and shall adopt and use practices, methods, operations, and processes which are reasonably adequate to render such employment and place of employment safe. Every employer shall do every thing reasonably necessary to protect the life and safety of employees.

(3) No employer shall require any employee to go or be in any employment or place of employment which is hazardous to the employee.

(4) No employer shall fail or neglect:

(a) To provide and use safety devices and safeguards.

(b) To adopt and use methods and processes reasonably adequate to render the employment and place of employment safe.

(c) To do every thing reasonably necessary to protect the life and safety of employees.

(5) No employer, owner, or lessee of any real property shall construct or cause to be constructed any place of employment that is hazardous to the employee.

(6) No person shall do any of the following:

(a) Remove, displace, damage, destroy or carry off any safety device, safeguard, notice, or warning, furnished for use in any employment or place of employment.

(b) Interfere in any way with the use thereof by any other person.

(c) Interfere with the use of any method or process adopted for the protection of any employee, including himself, in such employment, or place of employment.

(d) Fail or neglect to do every thing reasonably necessary to protect the life and safety of employees.

(7) The use of intoxicants or debilitating drugs while on duty is prohibited. Employees under the influence of intoxicants or drugs shall not be permitted in or around worksites. This subsection (7) shall not apply to employees taking prescription drugs or narcotics as directed and prescribed by a physician, provided such use does not endanger the employee or others.

[Order 74-26, § 296-155-040, filed 5/7/74, effective 6/6/74.]

## Part B-1

## OCCUPATIONAL HEALTH AND ENVIRONMENTAL CONTROL

## WAC

296-155-100	Management's responsibility.
296-155-105	Employee's responsibility.
296-155-110	Accident prevention program.
296-155-115	Safety bulletin board.
296-155-120	First-aid training and certification.
296-155-125	First-aid kit.
296-155-130	First-aid station.
296-155-135	First-aid room.
296-155-140	Sanitation.
296-155-145	Occupational noise exposure.
296-155-150	Ionizing radiation.
296-155-155	Nonionizing radiation.
296-155-160	Gases, vapors, fumes, dusts, and mists.
296-155-165	Lighting and illumination.
296-155-170	Ventilation.

**WAC 296-155-100 Management's responsibility.**

(1) It shall be the responsibility of management to establish and supervise:

(a) A safe and healthful working environment.

(b) An accident prevention program as required by these standards.

(c) Training programs to improve the skill and competency of all employees in the field of occupational safety and health.

(2) Employees required to handle or use poisons, caustics, and other harmful substances shall be instructed regarding the safe handling and use, and be made aware of the potential hazards, personal hygiene, and personal protective measures required.

(3) In job site areas where harmful plants or animals are present, employees who may be exposed shall be instructed regarding the potential hazards, and how to avoid injury, and the first aid procedures to be used in the event of injury.

(4) Employees required to handle or use flammable liquids, gases, or toxic materials shall be instructed in the safe handling and use of these materials and made aware of the specific requirements contained in Parts B, D, and other applicable parts of this standard.

(5) Confined spaces. The requirements of chapters 296-24, 296-62 and 296-155 WAC apply.

(6) The employer shall ensure that work assignments place no employee in a position or location not within ordinary calling distance of another employee able to render assistance in case of emergency.

Note: This subsection does not apply to operators of motor vehicles, watchmen or other jobs which, by their nature, are single employee assignments. However, a definite procedure for checking the welfare of all employees during working hours should be instituted and all employees so advised.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-100, filed 1/21/86; Order 76-6, § 296-155-100, filed 3/1/76; Order 74-26, § 296-155-100, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-105 Employee's responsibility.** (1) Employees shall coordinate and cooperate with all other employees in an attempt to eliminate accidents.

[Title 296 WAC—p 1910]

(2) Employees shall study and observe all safety standards governing their work.

(3) Employees shall apply the principles of accident prevention in their daily work and shall use proper safety devices and protective equipment as required by their employment or employer.

(4) Employees shall properly care for all personal protective equipment.

(5) Employees shall make a report, on the day of the incident, to their immediate supervisor, of each industrial injury or occupational illness, regardless of the degree of severity.

[Order 74-26, § 296-155-105, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-110 Accident prevention program.**

(1) Every employer shall develop a written accident prevention program, as required by WAC 296-24-040, and a safety and health committee plan, as required by WAC 296-24-045. Every employer, regardless of the number of employees, is required to implement the requirements of WAC 296-24-045, except that the provisions of WAC 296-24-045 and 296-24-040 (1)(b) may be accomplished by:

(a) Foreman-crew safety meetings held at least weekly.

(b) Foreman-crew meetings tailored to the particular operation.

(c) At least weekly, a walk-around safety inspection conducted jointly by one member of management and one employee, elected by the employees as their authorized representative.

(2) Minutes of each foreman-crew meeting shall be prepared and a copy shall be maintained at the location where the majority of the employees of each construction site report for work each day. Minutes of meetings shall be retained by the employer for at least one year and shall be made available for review by personnel of the division of industrial safety and health, upon request.

(3) Foreman-crew meetings shall address the following:

(a) A review of any walk-around safety inspection conducted since the last safety meeting.

(b) A review of any citation to assist in correction of hazards.

(c) An evaluation of any accident investigations conducted since the last meeting to determine if the cause of the unsafe acts or unsafe conditions involved were properly identified and corrected.

(d) Attendance shall be documented.

(e) Subjects discussed shall be documented.

Note: Subcontractors and their employees may attend the prime contractor's meeting provided that the prime contractor agrees and that all other requirements of this section are met.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-110, filed 1/21/86; Order 74-26, § 296-155-110, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-115 Safety bulletin board.** There shall be installed and maintained in every fixed establishment (the place where employees regularly report to work) employing eight or more persons, a safety bulletin

(1989 Ed.)

board sufficient in size to display and post safety bulletins, newsletters, posters, accident statistics and other safety educational material.

[Order 74-26, § 296-155-115, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-120 First-aid training and certification.** This section is designed to assure that all employees in this state are afforded quick and effective first-aid attention in the event of an on the job injury. To achieve this purpose the presence of personnel trained in first-aid procedures at or near those places where employees are working is required. Compliance with the provisions of this section may require the presence of more than one first-aid trained person.

(1) Each employer shall have available at all worksites, at all times, a person or persons holding a valid certificate of first-aid training from the department of labor and industries or other organization, association or agency that has been approved by the department.

(a) A valid first-aid certificate is one which is less than three years old.

(b) All foremen, supervisors or persons in direct charge of crews shall have a valid first-aid certificate.

(c) For the purposes of this section, a crew shall mean a group of two or more employees working at any worksite.

Note: In emergencies, foremen will be permitted to work up to thirty days without having the required certificate, providing an employee in the crew or another foreman in the immediate work area has the necessary certificate.

(2) Valid certification shall be achieved by passing a course of first-aid instruction and participation in practical application of the following subject matter:

- Bleeding control and bandaging.
- Cardio pulmonary resuscitation "C.P.R."
- Poisons.
- Shock, unconsciousness, stroke.
- Burns, scalds.
- Sunstroke, heat exhaustion.
- Frostbite, freezing, hypothermia.
- Strains, sprains, hernias.
- Fractures, dislocation.
- Proper transportation of the injured.
- Bites, stings.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-120, filed 1/21/86; Order 74-26, § 296-155-120, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-125 First-aid kit.** (1) All employers who employ men and women covered by the act shall furnish first-aid kits as required by the division of industrial safety and health, department of labor and industries, (RCW 51.36.030).

(2) First-aid supplies shall be readily accessible when required by this section.

(3) In the absence of readily accessible first-aid supplies such as first-aid kits, first-aid stations, first-aid rooms or their equivalent, all crew trucks, power shovels, cranes, locomotives, loaders, dozers, logging trucks, speeders, freight trucks and similar equipment shall be

equipped with not less than a ten package weather-proof first-aid kit.

(4) All crew vehicles used for transporting workers shall be equipped with not less than a ten package weather-proof first-aid kit. When more than five employees are being transported on any one trip, the kit shall be increased in size to comply with a 16-, 24-, or 36-package kit depending upon the number of personnel normally being transported.

(5) At least one weather-proof first-aid kit shall be available on construction jobs, line crews, and other transient or short duration jobs.

(6) The size and quantity of first-aid kits, required to be located at any site, shall be determined by the number of personnel normally dependent upon each kit as outlined in the following table:

Number of Personnel Normally Assigned To Worksite	Minimum First Aid Supplies Required At Worksite
1 - 50 persons	First-aid kit
1 - 5	10 package kit
6 - 15	16 package kit
16 - 30	24 package kit
31 - 50	36 package kit
51 - 200	First-aid station
51 - 75	One 36 and one 10 package kit
76 - 100	One 36 and one 16 package kit
101 - 150	One 36 and one 24 package kit
151 - 200	Two 36 package kits
Over 200 persons	First-aid room
	Refer to WAC 296-24-070

(7) Employers shall establish a procedure to ensure that first-aid kits and required contents are maintained in a serviceable condition.

(8) First-aid kits shall contain at least the following items, in a weatherproof container with individual sealed packages for each type of item:

**10 package kit**

- 1 Pkg. adhesive bandages, 1" (16 per pkg.)
- 1 Pkg. bandage compress, 4" (1 per pkg.)
- 1 Pkg. scissors\* and tweezers (1 each per pkg.)
- 1 Pkg. triangular bandage, 40" (1 per pkg.)
- 1 Pkg. antiseptic soap or pads (3 per pkg.)
- 5 Pkgs. of consulting physician's choice\*\*

**16 package kit**

- 1 Pkg. absorbent gauze, 24" x 72" (1 per pkg.)
- 1 Pkg. adhesive bandages, 1" (16 per pkg.)
- 2 Pkgs. bandage compresses, 4" (1 per pkg.)

- 1 Pkg. eye dressing (1 per pkg.)
- 1 Pkg. scissors\* and tweezers (1 each per pkg.)
- 2 Pkgs. triangular bandages, 40" (1 per pkg.)
- 1 Pkg. antiseptic soap or pads (3 per pkg.)
- 7 Pkgs. of consulting physician's choice\*\*

**24 package kit**

- 2 Pkgs. absorbent gauze, 24" x 72" (1 per pkg.)
- 2 Pkgs. adhesive bandages, 1" (16 per pkg.)
- 2 Pkgs. bandage compresses, 4" (1 per pkg.)
- 1 Pkg. eye dressing (1 per pkg.)
- 1 Pkg. scissors\* and tweezers (1 each per pkg.)
- 6 Pkgs. triangular bandages, 40" (1 per pkg.)
- 1 Pkg. antiseptic soap or pads (3 per pkg.)
- 9 Pkgs. of consulting physician's choice\*\*

**36 package kit**

- 4 Pkgs. absorbent gauze, 24" x 72" (1 per pkg.)
- 2 Pkgs. adhesive bandages, 1" (16 per pkg.)
- 5 Pkgs. bandage compresses, 4" (1 per pkg.)
- 2 Pkgs. eye dressing (1 per pkg.)
- 1 Pkg. scissors\* and tweezers (1 each per pkg.)
- 8 Pkgs. triangular bandages, 40" (1 per pkg.)
- 1 Pkg. antiseptic soap or pads (3 per pkg.)
- 13 Pkgs. of consulting physicians choice\*\*

\*Scissors shall be capable of cutting 2 layers of 15 oz. cotton cloth or its equivalent.

\*\*First-aid kits shall be maintained at the ten, sixteen, twenty-four or thirty-six package level. In the event the consulting physician chooses not to recommend items, the department shall be contacted for recommended items to complete the kit.

(9) When practical, a poster shall be fastened and maintained either on or in the cover of each first-aid kit and at or near all phones plainly stating worksite address or location, the phone numbers of available doctors, hospitals, and ambulance services within the district of the worksite.

Note: Preprinted Form No. SP 900L is available from all safety division offices. First-aid kit Form No. SP 900S is also available.

(10) Where the eyes or body of any person may be exposed to injurious chemicals and/or materials, suitable facilities for quick drenching or flushing of the eyes and body shall be provided, within the work area, for immediate emergency use.

(11) When required by the department, two wool blankets or two fire retardant blankets, capable of supporting 250 pounds each, and a stretcher shall be available in addition to first-aid kits.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-125, filed 1/21/86; Order 74-26, § 296-155-125, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-130 First-aid station.** (1) First-aid stations shall be well marked and located as close as practical to the highest concentration of employees.

(2) One person holding a valid first-aid certificate shall be responsible for the proper use and maintenance of the first-aid station.

[Title 296 WAC—p 1912]

(3) First-aid stations shall be equipped with a minimum of two first-aid kits, the size of which shall be dependent upon the number of personnel normally employed at the worksite. One first-aid kit may be a permanent wall-mounted kit, but in all cases the station shall be equipped with at least one portable first-aid kit.

(4) The first-aid station shall be equipped with two wool blankets, or two fire retardant blankets capable of supporting 250 pounds each, and a stretcher in addition to first-aid kits.

(5) A roster, denoting the telephone numbers and addresses of doctors, hospitals and ambulance services available to the worksite, shall be posted at each first-aid station.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-130, filed 1/21/86; Order 74-26, § 296-155-130, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-135 First-aid room.** Refer to the general safety and health standards, WAC 296-24-070.

[Order 74-26, § 296-155-135, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-140 Sanitation.** (1) Potable water.

(a) An adequate supply of potable water shall be provided in all places of employment.

(b) Portable containers used to dispense drinking water shall be capable of being tightly closed and equipped with a tap. Water shall not be dipped from containers.

(c) Any container used to distribute drinking water shall be clearly marked as to the nature of its contents and not used for any other purpose.

(d) The common drinking cup is prohibited.

(e) Where single service cups (to be used but once) are supplied, both a sanitary container for the unused cups and a receptacle for disposing of the used cups shall be provided.

(f) All water containers used to furnish drinking water shall be thoroughly cleaned at least once each week or more often as conditions require.

(g) The requirements of this subsection do not apply to mobile crews or to normally unattended work locations as long as employees working at these locations have transportation immediately available, within the normal course of their duties, to nearby facilities otherwise meeting the requirements of this section.

(h) The following definitions apply:

(i) Mobile crew: A work crew that routinely moves to a different work location periodically. Normally a mobile crew is not at the same location all day.

(ii) Normally unattended work location: An unattended site that is visited occasionally by one or more employees.

(iii) Nearby facility: A sanitary facility that is within three minutes travel by the transportation provided.

(2) Wash water.

(a) Clean, tepid wash water, between 70 and 100 degrees Fahrenheit, shall be provided at all construction sites.

(b) Individual hand towels shall be provided. Both a sanitary container for the unused towels and a receptacle for disposal of used towels shall be provided.

(c) Hand soap, industrial hand cleaner or similar cleansing agents shall be provided. Cleansing agents shall be adequate to remove any paints, coatings, herbicides, insecticides or other contaminants.

(d) The requirements of this subsection do not apply to mobile crews or to normally unattended work locations as long as employees working at these locations have transportation immediately available, within the normal course of their duties, to nearby facilities otherwise meeting the requirements of this section.

(e) Gasoline or solvents shall not be used for personal cleaning.

(f) Wash water areas will be maintained in a dry condition. Slipping or other hazards shall be eliminated from the wash water area before it is acceptable for use.

(3) Nonpotable water.

(a) Outlets for nonpotable water, such as water for industrial or firefighting purposes only, shall be identified by signs meeting the requirements of Part E of this chapter, to indicate clearly that the water is unsafe and is not to be used for drinking, washing or cooking purposes.

(b) There shall be no cross-connection, open or potential, between a system furnishing potable water, a system furnishing nonpotable water or a system furnishing wash water.

(4) Toilets.

(a) The provisions of this section apply to both portable chemical toilets and to flush toilets, except where flush toilets are used the requirements of WAC 296-24-12007 (1)(a) shall apply instead of (b) of this subsection.

(b) Accessible toilets shall be provided for employees according to the following table:

TABLE B-1

<u>Number of Employees</u>	<u>Toilets Required</u>
1 - 10	1
11 - 25	2
26 - 40	3
41 - 60	4
61 - 80	5
Over 80	one additional toilet for each additional twenty employees or any fraction thereof.

(c) When the employer provides both flush and portable chemical toilets, the number of employees allowed to be served by the flush toilets, per WAC 296-24-12007 (1)(a) will be calculated. That number will be subtracted from the total number of employees and the employer will be required to provide an adequate number of portable chemical toilets for the number of remaining employees, as required by (b) of this subsection.

(d) Toilets shall be maintained in clean, sanitary and functional condition. Internal latches shall be provided to secure the units from inadvertent entry. Where there are twenty or more employees consisting of both sexes, facilities shall be provided for each sex.

(i) Each unit shall be properly cleaned on a routine basis.

(ii) Chemicals, toilet tissue and sanitary seat covers shall be maintained in a supply sufficient for use during the entire shift.

(iii) Any defective or inadequate unit shall be immediately removed from service.

(e) Specifications. The following specifications apply:

(i) A noncaustic chemical toilet (portable chemical toilet is) a self-contained unit equipped with a waste receiving chemical holding container.

(ii) Portable chemical toilets consisting of only a holding tank, commonly referred to as "elevator units" or "elevator toilets" are not acceptable. "Elevator units" may be used if they are individually located in a lockable room which affords privacy. When this type unit is used in a private individual lockable room the entire room will be considered a toilet facility, as such the room will meet all requirements of toilet facilities and be inspected in accordance with subsection (5)(b)(iii) of this section.

(iii) Rooms, buildings or shelters housing toilets shall be of sound construction, easy to clean, provide shelter and provide privacy. The toilet rooms shall be ventilated to the outside and adequately lighted. All openings into the toilet room shall be covered with 16-mesh screen.

(iv) Toilets shall be serviced on a regular schedule. Servicing shall include the use of a disinfectant for cleaning urinals and seats, removing waste from containers, recharging containers with an odor controlling chemical and installing an adequate supply of toilet tissue and seat covers.

(v) Service shall be performed in accordance with local codes by approved servicing organizations. Waste shall be disposed of or discharged in accordance with requirements of local health department regulations.

(vi) Waste containers shall be fabricated from impervious materials, e.g. plastic, steel, fiberglass or their equivalent. Containers shall be water tight and capable of containing the chemical waste in a sanitary manner. The container shall be fitted to the building in a manner so as to prevent insects from entering from the exterior of the building. Containers shall be adequate in size to be used by the number of persons, according to the schedule for minimum requirements, without filling the container to more than half of its volume before regularly scheduled servicing.

(vii) Removal of waste shall be handled in a clean and sanitary manner by means of a vacuum hose and received by a leak-proof tank truck. All valves on the tank shall be leak-proof.

(viii) Provisions shall be made so service trucks have a clear approach and convenient access to the toilets to be serviced.

(ix) Disposal of waste from tank trucks shall be in accordance with local health department requirements. In the absence of provisions by local health departments, waste must be disposed of through municipal or district sanitary sewage systems. Municipal or area sanitary sewage districts shall provide sewage disposal locations and facilities which are adequate and convenient for duly authorized toilet service organizations.

(f) The requirements of this subsection do not apply to mobile crews or to normally unattended work locations as long as employees working at these locations have transportation immediately available, within the normal course of their duties, to nearby facilities otherwise meeting the requirements of this section.

(5)(a) On multi-employer worksites, the prime contractor shall ensure that the requirements of this section are met. Each employer is responsible for seeing that facilities for their own employees are provided.

(b) Each employer shall ensure, at the beginning of each shift, that the sanitation facilities required by this section are inspected. If any facility or unit fails to meet the following requirements, immediate corrective action shall be taken. Such action shall be documented and maintained at the site for at least 72 hours. Inspection shall establish:

(i) Potable water: Sufficient supply of water, sufficient supply of cups, container integrity, cleanliness of unit and area, capacity of trash receptacle (empty).

(ii) Wash water: Sufficient supply of clean water, proper temperature, sufficient supply of towels, sufficient supply of cleansing agents, container integrity, cleanliness of unit and area without the presence of physical hazards, capacity of trash receptacle (empty).

(iii) Toilets: Sufficient supply of toilet tissue and sanitary seat covers, capacity and condition of chemical agent, capacity and condition of holding tank, cleanliness of unit and area without the presence of physical hazards, physical and structural condition of unit, condition of lock, condition of toilet seat and tissue holder, absence of all foreign debris.

(c) The location of the facilities required by subsections (1), (2) and (4) of this section shall be as close as practical to the highest concentration of employees.

(i) On multistory structures they shall be furnished on every third floor.

(ii) At all sites they shall be located within 200 feet horizontally of all employees.

(iii) The requirements of subsection (5)(c)(i) and (ii) do not apply to mobile crews or to normally unattended work locations as long as employees working at these locations have transportation immediately available, within the normal course of their duties, to nearby facilities otherwise meeting the requirements of this section.

(6) Food handling. All employees' food service facilities and operations shall meet the applicable laws, ordinances and regulations of the jurisdictions in which they are located.

(7) Temporary sleeping quarters. When temporary sleeping quarters are provided, they shall be heated, ventilated and lighted.

[Statutory Authority: Chapter 49.17 RCW. 89-11-035 (Order 89-03), § 296-155-140, filed 5/15/89, effective 6/30/89. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-140, filed 1/21/86; Order 74-26, § 296-155-140, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-145 Occupational noise exposure.** The occupational noise exposure requirements of the general occupational health standards, chapter 296-62 WAC, shall apply.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 85-01-022 (Order 84-24), § 296-155-145, filed 12/11/84; 83-15-017 (Order 83-19), § 296-155-145, filed 7/13/83, effective 9/12/83; Order 76-29, § 296-155-145, filed 9/30/76; Order 74-26, § 296-155-145, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-150 Ionizing radiation.** (1) In construction and related activities involving the use of sources of ionizing radiation, the pertinent provisions of the Atomic Energy Commission's Standards for Protection Against Radiation, relating to protection against occupational radiation exposure, shall apply.

(2) Any activity which involves the use of radioactive material or x-ray, whether or not under license from the Atomic Energy Commission, shall be performed by competent persons specially trained in the proper and safe operation of such equipment. In the case of materials used under commission license, only persons actually licensed, or competent persons under direction and supervision of the licensee shall perform such work.

[Order 74-26, § 296-155-150, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-155 Nonionizing radiation.** (1) Only qualified and trained employees shall be assigned to install, adjust, and operate laser equipment.

(2) Proof of qualification of the laser equipment operator shall be available and in possession of operator at all times.

(3) Employees, when working in areas in which a potentially hazardous exposure (see WAC 296-62-09005(4)) to direct or reflected laser radiation exists, shall be provided with antilaser eye protection devices specified in Part C of this chapter.

(4) Areas in which Class II and III lasers are used shall be posted with standard laser warning placards.

(5) Beam shutters or caps shall be utilized, or the laser turned off, when laser transmission is not actually required. When the laser is left unattended for a substantial period of time, such as during lunch hour, overnight, or at change of shifts, the laser shall be turned off.

(6) Only mechanical or electronic means shall be used as a detector for guiding the internal alignment of the laser.

(7) The laser beam shall not be directed at employees.

(8) When it is raining or snowing, or when there is dust or fog in the air, and it is impracticable to cease laser system operation, employees shall be kept out of range of the area of source and target during such weather conditions.

(9) Laser equipment shall bear a conspicuously displayed label to indicate hazard classification. This label shall be prepared in accordance with 21 CFR 1040.10.

(10) Only Class I, II, or III laser equipment shall be used. Class IV laser equipment shall not be used.

(11) Laser unit in operation shall be set up above the heads of the employees, when possible.

(12) Employees shall not be exposed to radiofrequency/microwave radiation in excess of the permissible exposure limits specified in WAC 296-62-09005.



[Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-155, filed 1/21/86; 85-01-022 (Order 84-24), § 296-155-155, filed 12/11/84; Order 74-26, § 296-155-155, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-160 Gases, vapors, fumes, dusts, and mists.** (1) Exposure of employees to inhalation, ingestion, skin absorption, or contact with any material or substance at a concentration above those specified in the general occupational health standards, WAC 296-62-07515 shall be avoided.

(2) To achieve compliance with subsection (1) of this section, administrative or engineering controls must first be implemented whenever feasible. When such controls are not feasible to achieve full compliance, protective equipment or other protective measures shall be used to keep the exposure of employees to air contaminants within the limits prescribed in WAC 296-62-07515. Any equipment and technical measures used for this purpose must first be approved for each particular use by a competent industrial hygienist or other technically qualified person. Whenever respirators are used, their use shall comply with WAC 296-155-220.

(3) Whenever internal combustion equipment exhausts in enclosed spaces, tests shall be made and recorded to ensure that employees are not exposed to unsafe concentrations of toxic gases or oxygen deficient atmospheres. See chapter 296-62 WAC, the general occupational health standards.

(4) Whenever any employee is exposed to asbestos, the provisions of the general occupational health standards, chapter 296-62 WAC shall apply.

(5) Subsections (1) and (2) of this section do not apply to the exposure of employees to formaldehyde. Whenever any employee is exposed to formaldehyde, the requirements of WAC 296-62-07530 shall apply.

[Statutory Authority: Chapter 49.17 RCW. 88-14-108 (Order 88-11), § 296-155-160, filed 7/6/88; 87-24-051 (Order 87-24), § 296-155-160, filed 11/30/87. Statutory Authority: RCW 49.17.050(2) and 49.17.040. 87-10-008 (Order 87-06), § 296-155-160, filed 4/27/87. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-160, filed 1/21/86. Statutory Authority: RCW 49.17.040 and 49.17.050. 83-24-013 (Order 83-34), § 296-155-160, filed 11/30/83; Order 74-26, § 296-155-160, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-165 Lighting and illumination.** (1) Lighting which is adjusted to provide a margin of safety in production and inspection tasks shall be provided and maintained. The minimum level of task lighting in all indoor work places shall be an average of ten foot-candles measured thirty inches above the floor. MSHA approved cap lights are acceptable for use in tunnel headings.

(2) Whenever general lighting of an entire area is not provided, illumination sufficient to provide visibility of potentially hazardous objects and emergency control equipment shall be supplied. The minimum level of nontask lighting in all indoor work places shall be an average of three foot-candles measured thirty inches above the floor.

(3) Diffusion and distribution of artificial and natural light. Artificial light sources shall be installed with regard to mounting height, spacing and reflectors or other suitable accessories so as to secure a reasonably uniform distribution of illumination and to avoid glare and sharply defined shadows which could temporarily reduce a person's ability to see clearly.

Note: This section establishes minimal levels of illumination for safety purposes only. Guidelines pertaining to optimal levels of lighting and illumination may be found in Practice for Industrial Lighting ANSI/IES RP7-1979.

(4) The minimum levels specified in subsections (1) and (2) of this section represent averages with the lowest level in an area to be no less than fifty percent of the indicated value.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-165, filed 1/21/86; Order 74-26, § 296-155-165, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-170 Ventilation.** (1) **General.** Whenever hazardous substances such as dusts, fumes, mists, vapors, or gases exist or are produced in the course of construction work, their concentrations shall not exceed the limits specified in WAC 296-155-160(1). When ventilation is used as an engineering control method, the system shall be installed and operated according to the requirements of this section.

(2) **Local exhaust ventilation.** Local exhaust ventilation when used as described in (1) shall be designed to prevent dispersion into the air of dusts, fumes, mists, vapors, and gases in concentrations causing harmful exposure. Such exhaust systems shall be so designed that dusts, fumes, mists, vapors, or gases are not drawn through the work area of employees.

(3) **Design and operation.** Exhaust fans, jets, ducts, hoods, separators, and all necessary appurtenances, including refuse receptacles, shall be so designed, constructed, maintained and operated as to ensure the required protection by maintaining a volume and velocity of exhaust air sufficient to gather dusts, fumes, vapors, or gases from said equipment or process, and to convey them to suitable points of safe disposal, thereby preventing their dispersion in harmful quantities into the atmosphere where employees work.

(4) **Duration of operations.**

(a) The exhaust system shall be in operation continually during all operations which it is designed to serve. If the employee remains in the contaminated zone, the system shall continue to operate after the cessation of said operations, the length of time to depend upon the individual circumstances and effectiveness of the general ventilation system.

(b) Since dust capable of causing disability is, according to the best medical opinion, of microscopic size, tending to remain for hours in suspension in still air, it is essential that the exhaust system be continued in operation for a time after the work process or equipment served by the same shall have ceased, in order to ensure the removal of the harmful elements to the required extent.

Note: For the same reason, employees wearing respiratory equipment should not remove same immediately until a clear atmosphere has been established.

(5) Disposal of exhaust materials. The air outlet from every dust separator, and the dusts, fumes, mists, vapors, or gases collected by an exhaust or ventilating system shall discharge to the outside atmosphere. Collecting systems which return air to work area may be used if concentrations which accumulate in the work area air do not result in harmful exposure to employees. Dust and refuse discharged from an exhaust system shall be disposed of in such a manner that it will not result in harmful exposure to employees.

[Order 74-26, § 296-155-170, filed 5/7/74, effective 6/6/74.]

### Part B-2

## ASBESTOS, TREMOLITE, ANTHOPHYLLITE, AND ACTINOLITE

### WAC

296-155-180 Hazard communication.

#### DISPOSITION OF SECTIONS FORMERLY CODIFIED IN THIS SUBCHAPTER

- 296-155-175 Scope and application. [Statutory Authority: RCW 49.17.050(2) and 49.17.040. 87-10-008 (Order 87-06), § 296-155-175, filed 4/27/87.] Repealed by 87-24-051 (Order 87-24), filed 11/30/87. Statutory Authority: Chapter 49.17 RCW.
- 296-155-17505 Definitions. [Statutory Authority: RCW 49.17.050(2) and 49.17.040. 87-10-008 (Order 87-06), § 296-155-17505, filed 4/27/87.] Repealed by 87-24-051 (Order 87-24), filed 11/30/87. Statutory Authority: Chapter 49.17 RCW.
- 296-155-17510 Permissible exposure limits (PEL). [Statutory Authority: RCW 49.17.050(2) and 49.17.040. 87-10-008 (Order 87-06), § 296-155-17510, filed 4/27/87.] Repealed by 87-24-051 (Order 87-24), filed 11/30/87. Statutory Authority: Chapter 49.17 RCW.
- 296-155-17515 Communication among employers. [Statutory Authority: RCW 49.17.050(2) and 49.17.040. 87-10-008 (Order 87-06), § 296-155-17515, filed 4/27/87.] Repealed by 87-24-051 (Order 87-24), filed 11/30/87. Statutory Authority: Chapter 49.17 RCW.
- 296-155-17520 Identification. [Statutory Authority: RCW 49.17.050(2) and 49.17.040. 87-10-008 (Order 87-06), § 296-155-17520, filed 4/27/87.] Repealed by 87-24-051 (Order 87-24), filed 11/30/87. Statutory Authority: Chapter 49.17 RCW.
- 296-155-17525 Regulated areas. [Statutory Authority: RCW 49.17.050(2) and 49.17.040. 87-10-008 (Order 87-06), § 296-155-17525, filed 4/27/87.] Repealed by 87-24-051 (Order 87-24), filed 11/30/87. Statutory Authority: Chapter 49.17 RCW.
- 296-155-17530 Exposure monitoring. [Statutory Authority: RCW 49.17.050(2) and 49.17.040. 87-10-008 (Order 87-06), § 296-155-17530, filed 4/27/87.] Repealed by 87-24-051 (Order 87-24), filed 11/30/87. Statutory Authority: Chapter 49.17 RCW.
- 296-155-17532 Methods of compliance. [Statutory Authority: RCW 49.17.050(2) and 49.17.040. 87-10-008 (Order 87-06), § 296-155-17532, filed 4/27/87.] Repealed by 87-24-051 (Order 87-24), filed 11/30/87. Statutory Authority: Chapter 49.17 RCW.
- 296-155-17535 Respiratory protection. [Statutory Authority: RCW 49.17.050(2) and 49.17.040. 87-10-008 (Order 87-06), § 296-155-17535, filed 4/27/87.] Repealed by 87-24-051 (Order 87-24), filed 11/30/87. Statutory Authority: Chapter 49.17 RCW.
- 296-155-17540 Protective clothing. [Statutory Authority: RCW 49.17.050(2) and 49.17.040. 87-10-008 (Order 87-06), § 296-155-17540, filed 4/27/87.] Repealed by 87-24-051 (Order 87-24), filed 11/30/87. Statutory Authority: Chapter 49.17 RCW.
- 296-155-17545 Hygiene facilities and practices. [Statutory Authority: RCW 49.17.050(2) and 49.17.040. 87-10-008 (Order 87-06), § 296-155-17545, filed 4/27/87.] Repealed by 87-24-051 (Order 87-24), filed 11/30/87. Statutory Authority: Chapter 49.17 RCW.
- 296-155-17550 Communication of hazards to employees. [Statutory Authority: RCW 49.17.050(2) and 49.17.040. 87-10-008 (Order 87-06), § 296-155-17550, filed 4/27/87.] Repealed by 87-24-051 (Order 87-24), filed 11/30/87. Statutory Authority: Chapter 49.17 RCW.
- 296-155-17555 Housekeeping. [Statutory Authority: RCW 49.17.050(2) and 49.17.040. 87-10-008 (Order 87-06), § 296-155-17555, filed 4/27/87.] Repealed by 87-24-051 (Order 87-24), filed 11/30/87. Statutory Authority: Chapter 49.17 RCW.
- 296-155-17560 Medical surveillance. [Statutory Authority: RCW 49.17.050(2) and 49.17.040. 87-10-008 (Order 87-06), § 296-155-17560, filed 4/27/87.] Repealed by 87-24-051 (Order 87-24), filed 11/30/87. Statutory Authority: Chapter 49.17 RCW.
- 296-155-17565 Recordkeeping. [Statutory Authority: RCW 49.17.050(2) and 49.17.040. 87-10-008 (Order 87-06), § 296-155-17565, filed 4/27/87.] Repealed by 87-24-051 (Order 87-24), filed 11/30/87. Statutory Authority: Chapter 49.17 RCW.
- 296-155-17570 Dates. [Statutory Authority: RCW 49.17.050(2) and 49.17.040. 87-10-008 (Order 87-06), § 296-155-17570, filed 4/27/87.] Repealed by 87-24-051 (Order 87-24), filed 11/30/87. Statutory Authority: Chapter 49.17 RCW.
- 296-155-17575 Appendices. [Statutory Authority: RCW 49.17.050(2) and 49.17.040. 87-10-008 (Order 87-06), § 296-155-17575, filed 4/27/87.] Repealed by 87-24-051 (Order 87-24), filed 11/30/87. Statutory Authority: Chapter 49.17 RCW.
- 296-155-177 Appendix A—WISHA reference method—Mandatory. [Statutory Authority: RCW 49.17.050(2) and 49.17.040. 87-10-008 (Order 87-06), § 296-155-177, filed 4/27/87.] Repealed by 87-24-051 (Order 87-24), filed 11/30/87. Statutory Authority: Chapter 49.17 RCW.
- 296-155-179 Appendix B—Detailed procedure for asbestos, tremolite, anthophyllite, and actinolite sampling and analysis—Nonmandatory. [Statutory Authority: RCW 49.17.050(2) and 49.17.040. 87-10-008 (Order 87-06), § 296-155-179, filed 4/27/87.] Repealed by 87-24-051 (Order 87-24), filed 11/30/87. Statutory Authority: Chapter 49.17 RCW.
- 296-155-181 Appendix C—Qualitative and quantitative fit testing procedures—Mandatory. [Statutory Authority: RCW 49.17.050(2) and 49.17.040. 87-10-008 (Order 87-06), § 296-155-181, filed 4/27/87.] Repealed by 87-24-051 (Order 87-24), filed 11/30/87. Statutory Authority: Chapter 49.17 RCW.
- 296-155-183 Appendix D—Medical questionnaires—Mandatory. [Statutory Authority: RCW 49.17.050(2) and 49.17.040. 87-10-008 (Order 87-06), § 296-155-183, filed 4/27/87.] Repealed by 87-24-051 (Order 87-24), filed 11/30/87. Statutory Authority: Chapter 49.17 RCW.
- 296-155-185 Appendix E—Interpretation and classification of chest roentgenograms—Mandatory. [Statutory Authority: RCW 49.17.050(2) and 49.17.040. 87-10-008 (Order 87-06), § 296-155-185, filed 4/27/87.] Repealed by 87-24-051 (Order 87-24), filed 11/30/87. Statutory Authority: Chapter 49.17 RCW.

- 296-155-187 Appendix F—Work practices and engineering controls for major asbestos removal, renovation, and demolition operations—Nonmandatory. [Statutory Authority: RCW 49.17.050(2) and 49.17.040. 87-10-008 (Order 87-06), § 296-155-187, filed 4/27/87.] Repealed by 87-24-051 (Order 87-24), filed 11/30/87. Statutory Authority: Chapter 49.17 RCW.
- 296-155-189 Appendix G—Work practices and engineering controls for small-scale, short-duration asbestos renovation and maintenance operations—Nonmandatory. [Statutory Authority: RCW 49.17.050(2) and 49.17.040. 87-10-008 (Order 87-06), § 296-155-189, filed 4/27/87.] Repealed by 87-24-051 (Order 87-24), filed 11/30/87. Statutory Authority: Chapter 49.17 RCW.
- 296-155-191 Appendix H—Substance technical information for asbestos—Nonmandatory. [Statutory Authority: RCW 49.17.050(2) and 49.17.040. 87-10-008 (Order 87-06), § 296-155-191, filed 4/27/87.] Repealed by 87-24-051 (Order 87-24), filed 11/30/87. Statutory Authority: Chapter 49.17 RCW.
- 296-155-193 Appendix I—Medical surveillance guidelines for asbestos, tremolite, anthophyllite, and actinolite—Nonmandatory. [Statutory Authority: RCW 49.17.050(2) and 49.17.040. 87-10-008 (Order 87-06), § 296-155-193, filed 4/27/87.] Repealed by 87-24-051 (Order 87-24), filed 11/30/87. Statutory Authority: Chapter 49.17 RCW.

**WAC 296-155-180 Hazard communication.**  
General.

The employer shall develop and maintain a hazard communication program as required by WAC 296-62-054 through 296-62-05427 which will provide information to all employees relative to hazardous chemicals or substances to which they are exposed, or may become exposed, in the course of their employment.

[Statutory Authority: Chapter 49.17 RCW. 89-11-035 (Order 89-03), § 296-155-180, filed 5/15/89, effective 6/30/89.]

**Part C**

**PERSONAL PROTECTIVE AND LIFE SAVING EQUIPMENT**

**WAC**

- 296-155-200 General requirements.  
296-155-201 Definitions applicable to this chapter.  
296-155-203 Confined spaces.  
296-155-20301 Definitions.  
296-155-20307 Confined space work on sewer systems under construction.  
296-155-205 Head protection.  
296-155-210 Hearing protection.  
296-155-211 Leg protection.  
296-155-212 Foot protection.  
296-155-215 Eye and face protection.  
296-155-220 Respiratory protection.  
296-155-225 Safety belts, droplines, lifelines, and lanyards.  
296-155-230 Safety nets.  
296-155-235 Working over or adjacent to water.  
296-155-240 Sterilization of protective equipment.

**WAC 296-155-200 General requirements. (1) Application.**

(a) Protective equipment, including personal protective equipment for eyes, face, head, hearing, and extremities, protective clothing, respiratory devices, and protective shields and barriers, shall be used, and maintained in a sanitary and reliable condition wherever it is

necessary by reason of hazards of processes or environment, chemical hazards, radiological hazards, or mechanical irritants encountered in a manner capable of causing injury or impairment in the function of any part of the body through absorption, inhalation or physical contact.

(b) Employee owned equipment. Where employees provide their own protective equipment, the employer shall be responsible to assure its adequacy, including proper maintenance and sanitation of such equipment.

(c) Design. All personal protective equipment shall be of safe design and construction for the work to be performed.

(2) Construction personnel shall comply with plant or job safety practices and procedures, peculiar to particular industries and plants, relating to protective equipment and procedures when engaged in construction work in such plants or job sites.

(3) The employer is responsible for requiring the wearing of appropriate personal protective equipment in all operations where there is an exposure to hazardous conditions or where this part indicates a need for using such equipment to reduce the hazards to the employees.

(4) Where there is a danger of contact with moving parts of machinery, or the work process is such that a hazard exists:

(a) The clothing of employees shall fit closely about the body.

(b) Dangling neck wear, bracelets, wristwatches, rings, or similar articles shall not be worn by employees.

(5) Employees, whose duties are performed in areas and under circumstances where they are exposed to the danger of moving vehicles, shall wear work vests of highly visible materials, or equivalent distinguishing apparel.

(6) Employers shall ensure that employees wear no less than a short sleeved shirt, long pants, and shoes meeting the requirements of WAC 296-155-212. Employees shall wear no less than a short sleeved shirt, long pants, and shoes meeting the requirements of WAC 296-155-212.

Note: For additional personal protective and life saving equipment requirements, refer to the general safety and health standards, WAC 296-24-075 through 296-24-092.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-200, filed 1/21/86; Order 76-29, § 296-155-200, filed 9/30/76; Order 74-26, § 296-155-200, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-201 Definitions applicable to this chapter.** (1) "Catenary life line" means a horizontal rope between two fixed anchorages, independent of the work surface, to which the lanyard is attached, either by tying or by means of a sliding connection. A catenary life line shall be capable of supporting a minimum dead weight of 5,400 pounds per person, applied at the midpoint of the line.

(2) "Contaminant" means any material which by reason of its action upon, within, or to a person or object is likely to cause physical harm.

(3) "Dropline" means a vertical rope from a fixed anchorage, independent of the work surface, to which the lanyard is affixed or tied.

(4) "Fixed anchorage" means a secure point of attachment, not a part of the work surface, for droplines, lifelines, catenary life lines, or lanyards. The fixed anchorage and its appurtenances shall be capable of supporting a minimum dead weight of 5,400 pounds per worker.

(5) "Lanyard" means a rope, suitable for supporting one person. One end is fastened to a safety belt or harness and the other end is secured to a substantial object or a safety line.

(6) "Lifeline" means a rope, suitable for supporting one person, to which a lanyard or safety belt (or harness) is attached.

(7) "O.D." means optical density and refers to the light refractive characteristics of a lens.

(8) "Radiant energy" means energy that travels outward in all directions from its source.

(9) "Safety belt" means a device, usually worn around the waist which, by reason of its attachment to a lanyard and lifeline or a structure, will prevent a worker from falling.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-201, filed 1/21/86; Order 76-6, § 296-155-201, filed 3/1/76.]

**WAC 296-155-203 Confined spaces.** All work conducted in a confined space shall comply with the provisions of chapter 296-62 WAC and the following sections.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-203, filed 1/21/86.]

**WAC 296-155-20301 Definitions.** (1) Confined space - Any space having a limited means of egress which is subject to the accumulation of toxic or flammable contaminants or an oxygen deficient atmosphere. Confined spaces include but are not limited to storage tanks, process vessels, bins, boilers, ventilation or exhaust ducts, sewers, underground utility vaults, tunnels, pipelines and open top spaces more than 4 feet in depth, such as pits, tubes, vaults and vessels. (See WAC 296-62-14501(1).)

(2) Toxic atmospheres - Atmospheres having concentrations of airborne chemicals in excess of permissible exposure limits as defined in chapter 296-62 WAC.

(3) Chemical contact agents - Defined in WAC 296-62-07003.

(4) Oxygen deficient atmospheres - Atmospheres at sea level having less than 18% oxygen by volume or having a partial pressure of 135 millimeters of mercury or less. This may deviate when working at higher altitudes and should be determined for an individual location. Factors such as acclimatization, physical condition of persons involved, etc., must be considered for such circumstances and conditions. (See WAC 296-62-14501(4).)

(5) Flammable atmospheres - Atmospheres in excess of 20% of the lower explosive limit. These are usually

toxic as well as flammable. (See WAC 296-62-14501(5).)

[Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-20301, filed 1/21/86.]

**WAC 296-155-20307 Confined space work on sewer systems under construction.** New systems under construction or new installations which have not yet been connected to a used system, may substitute forced ventilation for the testing requirements of WAC 296-62-14523 provided:

(1) Ventilation is effectively provided at least five minutes prior to entry into the confined space;

(2) Ventilation is provided, as required by WAC 296-62-110, et seq., which supplies a continuous flow of air;

(3) Ventilation exhaust is discharged so as to present no hazard to other employees;

(4) A watchman is provided at the surface when there are employees in the manhole or pipe. The watchman shall not leave the manhole unattended until such time as all employees are out and the cover has been replaced; and

(5) All other requirements for confined spaces are observed. See chapter 296-62 WAC.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-20307, filed 1/21/86.]

**WAC 296-155-205 Head protection.** (1) All employees on any construction site shall be provided an individual hard hat which meets all requirements of (a) and (b) of this subsection. Employers shall provide individual hard hats at no cost to the employees.

(a) Hard hats for the protection of employees against impact and/or penetration of falling and flying objects shall meet the specifications contained in American National Standards Institute, Z89.1-1969, Safety Requirements for Industrial Head Protection.

(b) Hard hats for the head protection of employees exposed to high voltage electrical shock and burns shall meet the specifications contained in American National Standards Institute, Z89.2-1971.

(2) All employees must have their individual hard hats on site and readily available at all times.

(3) All employees shall wear a hard hat on any construction site whenever there is a potential exposure to danger of flying or falling objects to persons working or occupying the area.

Note: The hard hat may be removed whenever there is no potential exposure to a hazard.

(4) Employers of members of the Old Order Amish or the Sikh Dharma Brotherhood will not be cited for the failure to provide head protection and to require these employees to wear head protection provided these employee [employees] have so notified their employer of their religious objection to the wearing of hard hats, in writing.

(5) Employees working on asphalt paving crews when they are exposed to extreme temperatures from hot mix and when they are not exposed to falling objects need

not wear protective hard hats. Flaggers working in conjunction with asphalt paving operations shall wear protective hard hats.

(6) Caps with metal buttons or metal visors shall not be worn around electrical hazards.

(7) Employees working near moving machinery or in locations which present a hair-catching or fire hazard shall wear caps, nets or other head and face protection that will completely contain the hair.

[Statutory Authority: Chapter 49.17 RCW. 89-11-035 (Order 89-03), § 296-155-205, filed 5/15/89, effective 6/30/89. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-205, filed 1/21/86; Order 74-26, § 296-155-205, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-210 Hearing protection.** The hearing protection requirements of the general occupational health standards, chapter 296-62 WAC, shall apply.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 83-24-013 (Order 83-34), § 296-155-210, filed 11/30/83; Order 74-26, § 296-155-210, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-211 Leg protection.** Employees whose duties require them to operate a power chain saw shall wear flexible ballistic nylon pads, sewn or otherwise fastened into the trousers, or other equivalent protection that will protect the vulnerable areas of the legs.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-211, filed 1/21/86.]

**WAC 296-155-212 Foot protection.** (1) Substantial footwear, made of leather or other equally firm material, shall be worn by employees in any occupation in which there is a danger of injury to the feet through falling or moving objects, or from burning, scalding, cutting, penetration, or like hazard.

(a) The soles and heels of such footwear shall be of a material that will not create a slipping hazard.

(b) Shoes made of leather or other firm materials that have soft athletic-type soles which would protect employees from foot injuries and at the same time, provide soft and firm footing while working under specialty requirements or with specialty materials are acceptable if meeting safety shoe requirements established by OSHA or ANSI.

(c) Footwear that has deteriorated to a point where it does not provide the required protection shall not be used.

(2) Calks or other suitable footwear, which will afford reasonable protection from slipping, shall be worn while working on logs, poles, pilings, or similar forest products.

(3) Traditional tennis shoes, shoes with canvas tops, slippers, dress shoes or other similar type shoes shall not be worn. Soft or athletic-type soles with uppers of leather or other substantial material may be used where firm footing is desired and where minimal danger of injury to feet from falling or moving objects.

[Statutory Authority: Chapter 49.17 RCW. 89-11-035 (Order 89-03), § 296-155-212, filed 5/15/89, effective 6/30/89. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), §

296-155-212, filed 1/21/86; Order 74-26, § 296-155-212, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-215 Eye and face protection.** (1) General.

(a) Employees shall use eye and face protection equipment when machines or operations present potential eye or face injury from physical, chemical, or radiation agents.

(b) Eye and face protection equipment required by this part shall meet the requirements specified in American National Standards Institute, Z87.1-1968, Practice for Occupational and Educational Eye and Face Protection.

(c) Employees whose vision requires the use of corrective lenses in spectacles, when required by this regulation to wear eye protection, shall be protected by goggles or spectacles of one of the following types:

(i) Spectacles whose protective lenses provide optical correction;

(ii) Goggles that can be worn over corrective spectacles without disturbing the adjustment of the spectacles.

(iii) Goggles that incorporate corrective lenses mounted behind the protective lenses.

(d) Face and eye protection equipment shall be kept clean and in good repair. The use of this type equipment with structural or optical defects shall be prohibited.

(e) Table C-1 shall be used as a guide in the selection of face and eye protection for the hazards and operations noted.

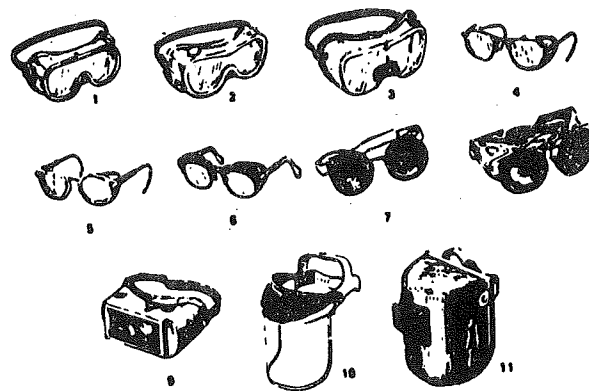


TABLE C-1

EYE AND FACE PROTECTION SELECTION GUIDE

1. GOGGLES, flexible fitting, regular ventilation
2. GOGGLES, flexible fitting, hooded ventilation
3. GOGGLES, cushioned fitting, rigid body
- \*4. SPECTACLES, metal frame, with sideshields
- \*5. SPECTACLES, plastic frame with sideshields
- \*6. SPECTACLES, metal-plastic frame, with sideshields
- \*\*7. WELDING GOGGLES, eyecup type, tinted lenses (illustrated)
- 7A. CHIPPING GOGGLES, eyecup type, clear safety lenses (not illustrated)

- \*\*8. WELDING GOGGLES, coverspec type tinted lenses (illustrated)
- 8A. CHIPPING GOGGLES, coverspec type, clear safety lenses (not illustrated)
- \*\*9. WELDING GOGGLES, coverspec type, tinted plate lens
- 10. FACE SHIELD (available with plastic or mesh window)
- 11. WELDING HELMETS

\*Nonside shield spectacles are available for limited hazard use requiring only frontal protection.

\*\*See Table C-2 in (2) of this section, Filter lens shade numbers for protection against radiant energy.

APPLICATIONS

OPERATION	HAZARDS	RECOMMENDED PROTECTORS: Underscored Numbers Signify Preferred Protection
ACETYLENE-BURNING ACETYLENE-CUTTING ACETYLENE-WELDING	SPARKS, HARMFUL RAYS, MOLTEN METAL, FLYING PARTICLES	<u>7</u> , <u>8</u> , <u>9</u>
CHEMICAL HANDLING	SPLASH, ACID BURNS, FUMES	<u>2</u> , 10 (for severe exposure add <u>10</u> over 2)
CHIPPING	FLYING PARTICLES	<u>1</u> , <u>3</u> , <u>4</u> , <u>5</u> , <u>6</u> , <u>7A</u> , <u>8A</u>
ELECTRIC (ARC) WELDING	SPARKS, INTENSE RAYS, MOLTEN METAL	<u>9</u> , <u>11</u> (11 in combination with 4, 5, 6, in tinted lenses, advisable)
FURNACE OPERATIONS	GLARE, HEAT, MOLTEN METAL	<u>7</u> , <u>8</u> , <u>9</u> (for severe exposure add <u>10</u> )
GRINDING-LIGHT	FLYING PARTICLES	<u>1</u> , <u>3</u> , <u>4</u> , <u>5</u> , <u>6</u> , <u>10</u>
GRINDING-HEAVY	FLYING PARTICLES	<u>1</u> , <u>3</u> , <u>7A</u> , <u>8A</u> (for severe exposure add 10)
LABORATORY	CHEMICAL SPLASH, GLASS BREAKAGE	<u>2</u> (10 when in combination with <u>4</u> , <u>5</u> , <u>6</u> )
MACHINING	FLYING PARTICLES	<u>1</u> , <u>3</u> , <u>4</u> , <u>5</u> , <u>6</u> , <u>10</u>
MOLTEN METALS	HEAT, GLARE, SPARKS, SPLASH	<u>7</u> , <u>8</u> (10 in combination with <u>4</u> , <u>5</u> , <u>6</u> , in tinted lenses)
SPOT WELDING	FLYING PARTICLES, SPARKS	<u>1</u> , <u>3</u> , <u>4</u> , <u>5</u> , <u>6</u> , <u>10</u>

(2) Protection against radiant energy. (a) Selection of shade numbers for welding filter. Table C-2 shall be used as a guide for the selection of the proper shade numbers of filter lenses or plates used in welding. Shades more dense than those listed may be used to suit the individual's needs.

TABLE C-2

FILTER LENS SHADE NUMBERS FOR PROTECTION AGAINST RADIANT ENERGY

Welding Operation	Shade number
Shielded metal-arc welding 1/16-, 3/32-, 1/8-, 5/32-inch diameter electrodes	10
Gas-shielded arc welding (nonferrous) 1/16-, 3/32-, 1/8-, 5/32-inch diameter electrodes	11
Gas-shielded arc welding (ferrous) 1/16-, 3/32-, 1/8-, 5/32-inch diameter electrodes	12
Shielded metal-arc welding 3/16-, 7/32-, 1/4-inch diameter electrodes	12
5/16-, 3/8-inch diameter electrodes	14
Atomic hydrogen welding	10-14
Carbon-arc welding	14
Soldering	2
Torch brazing	3 or 4
Light cutting, up to 1 inch	3 or 4
Medium cutting, 1 inch to 6 inches	4 or 5
Heavy cutting, over 6 inches	5 or 6
Gas welding (light), up to 1/8-inch	4 or 5
Gas welding (medium), 1/8-inch to 1/2-inch	5 or 6
Gas welding (heavy), over 1/2-inch	6 or 9

(b) Laser protection.

(i) Employees whose occupation or assignment requires potentially hazardous exposure (see WAC 296-62-09005(4)) to laser radiation shall wear suitable laser safety goggles which will protect for the specific wavelength of the laser and be of optical density (O.D.) adequate for the energy involved. Table C-3 lists the maximum power or energy density for which adequate protection is afforded by glasses of optical densities from 5 through 8.

TABLE C-3

SELECTING LASER SAFETY GLASS

INTENSITY	ATTENUATION	
	Optical density (O.D.)	Attenuation factor
CW maximum power density (watts/cm <sup>2</sup> )		
10 <sup>-2</sup>	5	10 <sup>5</sup>
10 <sup>-1</sup>	6	10 <sup>6</sup>
1.0	7	10 <sup>7</sup>
10.0	8	10 <sup>8</sup>

Output levels falling between lines in this table shall require the higher optical density.

(ii) All protective goggles shall bear a label identifying the following data:

- (a) The laser wavelengths for which use is intended;
- (b) The optical density of those wavelengths.
- (c) The visible light transmission.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 85-01-022 (Order 84-24), § 296-155-215, filed 12/11/84; Order 74-26, § 296-155-215, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-220 Respiratory protection. General.** In emergencies, or when controls required by Part B of this chapter either fail or are inadequate to prevent harmful exposure to employees, appropriate respiratory



protective devices shall be provided by the employer and shall be used in accordance with WAC 296-62-071.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 83-15-017 (Order 83-19), § 296-155-220, filed 7/13/83, effective 9/12/83; Order 74-26, § 296-155-220, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-225 Safety belts, droplines, lifelines, and lanyards. (1) GENERAL.**

(a) When work is to be performed from locations 10 feet or more in height guardrails or wire rope railings shall be installed.

(b) Safety belts shall be used when workers are exposed to the hazard of falling from buildings, bridges, structures, or construction members such as trusses, beams, purlins, or plates at elevations exceeding 10 feet above ground, water surface, or continuous floor level below.

(c) When requirements in (a) and (b) of this subsection are impractical, approved-type safety nets shall be used. WAC 296-155-230

(d) When the work is of limited duration and limited exposure, and the hazards involved in rigging and installing the safety devices required by this section equal or exceed the hazards involved in the actual construction, these provisions may be temporarily suspended for connectors only, provided adequate risk control is exercised under immediate competent supervision.

(2)(a) Safety belts and lanyards shall be worn by any worker exposed to a fall of ten feet or more from an elevated work area not otherwise protected by the provisions of this section. The anchor end of the lanyard shall be secured at a level not lower than the workman's waist, and at a horizontal distance not to exceed 6 feet. Where the waist level connection is not possible, connections at foot level may be permitted, provided that adequate risk control procedures are followed. Lanyards shall be secured to a substantial member of the structure or to securely rigged lines.

(b) If worker's duties require horizontal movement, rigging shall be provided so that the attached lanyard will slide along with him. Such rigging shall be provided for all suspended staging, outdoor advertising sign platforms, floats, and all other catwalks, or walkways 10 feet or more above the ground or level beneath.

(3) Lifelines, droplines, safety belts and lanyards shall be used only for employee safeguarding. Any lifeline, safety belt or lanyard actually subjected to in-service loading, as distinguished from static load testing, shall be immediately removed from service and shall not be used again for employee safeguarding.

(4) Droplines shall be secured to an anchorage or structural member capable of supporting a minimum dead weight of 5,400 pounds, and shall extend below the operation a sufficient distance to permit a safe landing but shall not touch the ground, walking surface, or safe landing area.

(5) Droplines or lifelines used on rock-scaling operations, or in areas where the lifeline may be subjected to cutting or abrasion, shall be a minimum of 7/8-inch wire core manila rope. For all other lifeline applications, a minimum of 3/4-inch manila or equivalent, with a

minimum breaking strength of 5,400 pounds, shall be used.

(6) Safety belt lanyard shall be a minimum of 1/2-inch nylon, or equivalent, with a maximum length to provide for a fall of no greater than 6 feet. The rope shall have a nominal breaking strength of 5,400 pounds.

(7) All safety belt, harness, and lanyard hardware shall be drop forged or pressed steel, cadmium plated in accordance with type 1, Class B plating specified in Federal Specification QQ-P-416. Surface shall be smooth and free of sharp edges.

(8) All safety belt and lanyard hardware assemblies shall be capable of withstanding a tensile loading of 4,000 pounds without cracking, breaking, or taking a permanent deformation and shall conform to the requirements of ANSI A10.14-1975.

(9) No employee shall enter a gas main, sewer, sewer flue, duct, tunnel, or other similar place without first notifying the supervisor of his intention to do so. Employees entering such places shall wear a safety harness with attached retriever line. A watchman capable of maintaining communications at all times shall be stationed at the opening through which the worker entered. See WAC 296-62-145 through 296-62-14529.

(10) Safety belts, harnesses, lanyards, lifelines or droplines, independently attached or attended, shall be used while performing the following types of work when other equivalent type protection is not provided:

(a) Work in hoppers, bins, silos, tanks, or other confined spaces.

(b) Work on hazardous slopes, structural steel (except as provided in subsection (1)(d) of this section), erecting or dismantling safety nets, tying reinforcing bars, working on poles or from boatswains chairs at elevations greater than six feet (1.83 m), swinging scaffolds or other unguarded locations.

(c) Work on skips and platforms used in shafts by crews when the skip or cage does not occlude the opening to within one foot (30.5 cm) of the sides of the shaft, unless cages are provided.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-225, filed 1/21/86; Order 76-29, § 296-155-225, filed 9/30/76; Order 74-26, § 296-155-225, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-230 Safety nets. (1)(a)** Where the elevation is 10 feet or more above the ground, water surface, or level below, and when the use of safety belts and lifelines or more conventional types of protection are clearly impractical, the exterior and interior of the structure shall be provided with an approved-type safety net extending at least 8 feet horizontally from the perimeter and positioned at a safe distance not to exceed 10 feet vertically below the working surface. Nets shall be hung with sufficient clearance to prevent contact with the surfaces or structures below. Such clearances shall be determined by impact load testing.

(b) It is intended that only one level of nets be required for bridge construction.

(c) Safety nets shall be provided wherever workers are permitted to be underneath a work area not otherwise



protected from falling objects. In such cases, nets shall be lined with a mesh of size and strength sufficient to contain tools and materials capable of causing injury. Net linings shall be of not more than 1-inch mesh and be constructed of synthetic twine not less than No. 18-inch size or of wire not less than 22 gauge.

(2) The mesh size of nets shall not exceed 6 inches by 6 inches. All new nets shall meet accepted performance standards of 17,500 foot-pounds minimum impact resistance as determined and certified by the manufacturers, and shall bear a label of proof test. Edge ropes shall provide a minimum breaking strength of 5,000 pounds.

(3) Forged steel safety hooks or shackles shall be used to fasten the net to its supports.

(4) Connections between net panels shall develop the full strength of the net.

(5) The safety net shall be tested on-the-job in the suspended position immediately following installation or major repair and at six-month intervals thereafter.

(6) The test shall consist of dropping a 400-pound bag of sand not more than 30 inches in diameter from a height of twenty-five feet above the net into the center of the net.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-230, filed 1/21/86; Order 74-26, § 296-155-230, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-235 Working over or adjacent to water.** (1) When an employee is employed under conditions which expose him to a risk of drowning, he shall wear a U.S. Coast Guard approved life saving device, unless it can be shown that conditions, such as shallow water, are such that flotation would not be achieved.

(2) Prior to and after each use, the buoyant life saving device shall be inspected for defects which would alter their strength or buoyancy. Defective units shall not be used.

(3) Ring buoys with at least 90 feet of line shall be provided and readily available for emergency rescue operations. Distance between ring buoys shall not exceed 200 feet.

(4) At least one lifesaving skiff shall be immediately available at locations where employees are working over or adjacent to water. Each skiff, or skiffs, shall:

(a) Be suitable for conditions where used.

(b) Be equipped with oar locks securely attached to gunwales, oars, one boat hook, and one cork ring buoy with fifty feet of suitable line attached.

(5) Whenever boats or skiffs cannot be used, due to swift currents, life lines close to the water surface shall be provided and, wherever practicable, a line shall be stretched across the stream with tag lines.

(6) Where workers are transported by boat or barge, only such number of persons shall be carried that can be safely accommodated on fixed seats. Capacity showing number of persons shall be plainly marked on vessel.

(7) All workers shall be provided with a U.S. Coast Guard approved buoyant life saving device while transported in open boats and/or barges, and where deemed necessary by the department, workers shall wear same while in transport.

[Order 74-26, § 296-155-235, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-240 Sterilization of protective equipment.** Goggles, gloves, respirators and other protectors shall not be interchanged among employees for use unless they have been thoroughly cleaned since last use.

[Order 74-26, § 296-155-240, filed 5/7/74, effective 6/6/74.]

## Part D

### FIRE PROTECTION AND PREVENTION

#### WAC

296-155-250	Definitions applicable to this part.
296-155-260	Fire protection.
296-155-265	Fire prevention.
296-155-270	Flammable and combustible liquids.
296-155-275	Liquefied petroleum gas (LP-gas).
296-155-280	Temporary heating devices.

**WAC 296-155-250 Definitions applicable to this part.** (1) "Approved" for the purpose of this part, means equipment that has been listed or approved by a nationally recognized testing laboratory such as Factory Mutual Engineering Corp., or Underwriters' Laboratories, Inc., federal agencies such as United States Mine Safety and Health Administration or United States Coast Guard, which issue approvals for such equipment, or the department of labor and industries.

(2) "Closed container" means a container so sealed by means of a lid or other device that neither liquid nor vapor will escape from it at ordinary temperatures.

(3) "Combustible liquid" means any liquid having a flashpoint at or above 100°F (37.8°C). Combustible liquids shall be divided into two classes as follows:

(a) "Class II liquids" shall include those with flashpoints at or above 100°F (37.8°C) and below 140°F (60°C), except any mixture having components with flashpoints of 200°F (93.3°C) or higher, the volume of which make up 99 percent or more of the total volume of the mixture.

(b) "Class III liquids" shall include those with flashpoints at or above 140°F (60°C). Class III liquids are subdivided into two subclasses:

(i) "Class IIIA liquids" shall include those with flashpoints at or above 140°F (60°C) and below 200°F (93.3°C), except any mixture having components with flashpoints of 200°F (93.3°C), or higher, the total volume of which make up 99 percent or more of the total volume of the mixture.

(ii) "Class IIIB liquids" shall include those with flashpoints at or above 200°F (93.3°C). This section does not cover Class IIIB liquids. Where the term "Class III liquids" is used in this section, it shall mean only Class IIIA liquids.

(c) When a combustible liquid is heated for use to within 30°F (16.7°C) of its flashpoint, it shall be handled in accordance with the requirements for the next lower class of liquids.

(4) "Combustion" means any chemical process that involves oxidation sufficient to produce light or heat.

(5) "Fire brigade" means an organized group of employees that are knowledgeable, trained, and skilled in the safe evacuation of employees during emergency situations and in assisting in fire fighting operations.

(6) "Fire resistance" means so resistant to fire that, for specified time and under conditions of a standard heat intensity, it will not fail structurally and will not permit the side away from the fire to become hotter than a specified temperature. For purposes of this part, fire resistance shall be determined by the Standard Methods of Fire Tests of Building Construction and Materials, NFPA 251-72.

(7) "Flammable" means capable of being easily ignited, burning intensely or having a rapid rate of flame spread.

(8) "Flammable liquid" means any liquid having a flashpoint below 100°F (37.8°C), except any mixture having components with flashpoints of 100°F (37.8°C) or higher, the total of which make up 99 percent or more of the total volume of the mixture. Flammable liquids shall be known as Class I liquids. Class I liquids are divided into three classes as follows:

(a) Class IA shall include liquids having flashpoints below 73°F (22.8°C) and having a boiling point below 100°F (37.8°C).

(b) Class IB shall include liquids having flashpoints below 73°F (22.8°C) and having a boiling point at or above 100°F (37.8°C).

(c) Class IC shall include liquids having flashpoints at or above 73°F (22.8°C) and below 100°F (37.8°C).

(9) "Flashpoint" means the minimum temperature at which a liquid gives off vapor within a test vessel in sufficient concentration to form an ignitable mixture with air near the surface of the liquid, and shall be determined as follows:

(a) For a liquid which has a viscosity of less than 45 SUS at 100°F (37.8°C), does not contain suspended solids, and does not have a tendency to form a surface film while under test, the procedure specified in the Standard Method of Test for Flashpoint by Tag Closed Tester (ASTM D-56-70) shall be used.

(b) For a liquid which has a viscosity of 45 SUS or more at 100°F (37.8°C), or contains suspended solids, or has a tendency to form a surface film while under test, the Standard Method of Test for Flashpoint by Pensky-Martens Closed Tester (ASTM D-93-71) shall be used, except that the methods specified in Note 1 to section 1.1 of ASTM D-93-71 may be used for the respective materials specified in the note.

(10) "Liquified petroleum gases" "LPG" and "LP Gas" mean and include any material which is composed predominantly of any of the following hydrocarbons, or mixtures of them, such as propane, propylene, butane (normal butane or isobutane), and butylenes.

(11) "Portable tank" means a closed container having a liquid capacity more than 60 U.S. gallons, and not intended for fixed installation.

(12) "Safety can" means an approved closed container, of not more than 5 gallons capacity, having a spring-closing lid and spout cover and so designed that it

will safely relieve internal pressure when subjected to fire exposure.

(13) "Salamander" means a portable heating device, solid or liquid fueled, which is not vented to the outdoor atmosphere.

(14) "Vapor pressure" means the pressure, measured in pounds per square inch (absolute), exerted by a volatile liquid as determined by the "Standard Method of Test for Vapor Pressure of Petroleum Products (Reid Method)," (ASTM D-323-68).

[Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-250, filed 1/21/86; Order 74-26, § 296-155-250, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-260 Fire protection. (1) General requirements.**

(a) The employer shall be responsible for development of a fire protection program to be followed throughout all phases of construction and demolition work, and he shall provide for firefighting equipment as specified in this part. As fire hazards occur, there shall be no delay in providing necessary equipment.

(b) Access to all available firefighting equipment shall be maintained at all times.

(c) All firefighting equipment, provided by the employer, shall be conspicuously located.

(d) All firefighting equipment shall be periodically inspected by a competent person, and maintained in operating condition. Defective equipment shall be immediately replaced.

(e) As warranted by the project, the employer shall provide a trained and equipped firefighting organization (fire brigade) to assure adequate protection to life.

(2) Water supply.

(a) A temporary or permanent water supply, of sufficient volume, duration, and pressure, required to properly operate firefighting equipment shall be made available as soon as combustible materials accumulate.

(b) Where underground water mains are to be provided, they shall be installed, completed, and made available for use as soon as practicable.

(3) Portable firefighting equipment.

(a) A fire extinguisher, rated not less than 2A, shall be provided for each 3,000 square feet of a combustible building area, or major fraction thereof. Travel distance from any point of the protected area to the nearest fire extinguisher shall not exceed a horizontal distance of 100 feet.

Note: One 55-gallon open drum of water with two fire pails may be substituted for a fire extinguisher having a 2A rating.

(b) A 1/2-inch diameter garden-type hose line, not to exceed 100 feet in length and equipped with a nozzle, may be substituted for a 2A-rated fire extinguisher, provided it is capable of discharging a minimum of 5 gallons per minute with a minimum hose stream range of 30 feet horizontally. The garden-type hose lines shall be mounted on conventional racks or reels. The number and location of hose racks or reels shall be such that at least one hose stream can be applied to all points in the area.

(c) One or more fire extinguishers, rated not less than 2A, shall be provided on each floor. In multistory buildings, where combustibles are present, at least one fire extinguisher shall be located adjacent to a stairway.

(d) Extinguishers and water drums, subject to freezing, shall be protected from freezing.

(e) A fire extinguisher, rated not less than 10B, shall be provided within 50 feet of wherever more than 5 gallons of flammable or combustible liquids or 5 pounds of flammable gas are being used on the jobsite. This requirement does not apply to the integral fuel tanks of motor vehicles.






(f) Carbon tetrachloride and other toxic vaporizing liquid fire extinguishers are prohibited.

(g) Portable fire extinguishers shall be inspected periodically and maintained in accordance with Maintenance and Use of Portable Fire Extinguishers, NFPA No. 10A-1981 and the general safety and health standards, WAC 296-24-59007.

(h) Fire extinguishers which have been listed or approved by a nationally recognized testing laboratory, shall be used to meet the requirements of this part. (See Table D-1)

Table D-1

KNOW YOUR FIRE EXTINGUISHERS

 DEPARTMENT OF LABOR UNITED STATES OF AMERICA	WATER TYPE				FOAM	CARBON DIOXIDE	DRY CHEMICAL			
	STORED PRESSURE	CARTRIDGE OPERATED	WATER PUMP TANK	SODA ACID			SODIUM OR POTASSIUM BICARBONATE	MULTI-PURPOSE ABC		
<b>CLASS A</b> FIRES WOOD, PAPER, TRASH HAVING GLOWING ENDERS 	YES	YES	YES	YES	YES	NO <small>(BUT WILL CONTROL SMALL SURFACE FIRES)</small>	NO <small>(BUT WILL CONTROL SMALL SURFACE FIRES)</small>	NO <small>(BUT WILL CONTROL SMALL SURFACE FIRES)</small>	YES	YES
<b>CLASS B</b> FIRES FLAMMABLE LIQUIDS, GASOLINE, OIL, PAINTS, GREASE, ETC. 	NO	NO	NO	NO	YES	YES	YES	YES	YES	YES
<b>CLASS C</b> FIRES ELECTRICAL EQUIPMENT 	NO	NO	NO	NO	NO	YES	YES	YES	YES	YES
<b>CLASS D</b> FIRES COMBUSTIBLE METALS 	SPECIAL EXTINGUISHING AGENTS APPROVED BY RECOGNIZED TESTING LABORATORIES									
METHOD OF OPERATION	PULL PIN-SQUEEZE HANDLE	TURN UPSIDE DOWN AND DUMP	PUMP HANDLE	TURN UPSIDE DOWN	TURN UPSIDE DOWN	PULL PIN-SQUEEZE LEVER	RUPTURE CARTRIDGE SQUEEZE LEVER	PULL PIN-SQUEEZE HANDLE	PULL PIN-SQUEEZE HANDLE	RUPTURE CARTRIDGE SQUEEZE LEVER
RANGE	30' - 40'	30' - 40'	30' - 40'	30' - 40'	30' - 40'	3' - 8'	5' - 20'	5' - 20'	5' - 20'	5' - 20'
MAINTENANCE	CHECK AIR PRESSURE GAUGE MONTHLY	WEIGH GAS CARTRIDGE AND WATER IF REQUIRED ANNUALLY	DISCHARGE AND FILL WITH WATER ANNUALLY	DISCHARGE ANNUALLY RECHARGE	DISCHARGE ANNUALLY RECHARGE	WEIGH GIM ANNUALLY	WEIGH GAS CARTRIDGE, CHECK CONDITION OF DRY CHEMICAL ANNUALLY	CHECK PRESSURE GAUGE AND CONDITION OF DRY CHEMICAL ANNUALLY	CHECK PRESSURE GAUGE AND CONDITION OF DRY CHEMICAL ANNUALLY	WEIGH GAS CARTRIDGE CHECK CONDITION OF DRY CHEMICAL ANNUALLY

Note: One hundred feet, or less, of 1-1/2 inch hose, with a nozzle capable of discharging water at 25 gallons or more per minute, may be substituted for a fire extinguisher rated not more than 2A in the designated area provided that the hose line can reach all points in the area.

(i) If fire hose connections are not compatible with local firefighting equipment, the contractor shall provide adapters, or equivalent, to permit connections.

(j) During demolition involving combustible materials, charged hose lines, supplied by hydrants, water tank trucks with pumps, or equivalent, shall be made available.

(4) Fixed firefighting equipment.

(a) Sprinkler protection.

(i) If the facility being constructed includes the installation of automatic sprinkler protection, the installation shall closely follow the construction and be placed

in service as soon as applicable laws permit following completion of each story.

(ii) During demolition or alterations, existing automatic sprinkler installations shall be retained in service as long as reasonable. The operation of sprinkler control valves shall be permitted only by properly authorized persons.

Note: Modification of sprinkler systems to permit alterations or additional demolition should be expedited so that the automatic protection may be returned to service as quickly as possible. Sprinkler control valves shall be checked daily at close of work to ascertain that the protection is in service.

(b) Standpipes. In all structures in which standpipes are required, or where standpipes exist in structures being altered, they shall be brought up as soon as applicable laws permit, and shall be maintained as construction progresses in such a manner that they are always ready

for fire protection use. The standpipes shall be provided with Siamese fire department connections on the outside of the structure, at the street level, which shall be conspicuously marked. There shall be at least one standard hose outlet at each floor.

(5) Fire alarm devices.

(a) An alarm system, e.g., telephone system, siren, etc., shall be established by the employer whereby employees on the site and the local fire department can be alerted for an emergency.

(b) The alarm code and reporting instructions shall be conspicuously posted at phones and at employee entrances.

(6) Fire cutoffs.

(a) Fire walls and exit stairways, required for the completed buildings, shall be given construction priority. Fire doors, with automatic closing devices, shall be hung on openings as soon as practical.

(b) Fire cutoffs shall be retained in buildings undergoing alterations or demolition until operations necessitate their removal.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-260, filed 1/21/86; Order 76-6, § 296-155-260, filed 3/1/76; Order 74-26, § 296-155-260, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-265 Fire prevention.** (1) Ignition hazards.

(a) Electrical wiring and equipment for light, heat, or power purposes shall be installed in compliance with the requirements of Part I of this standard.

(b) Internal combustion engine powered equipment shall be so located that exhausts are well away from combustible materials. When exhausts are piped to outside the building under construction, a clearance of at least 6 inches shall be maintained between such piping and combustible material.

(c) Smoking shall be prohibited at or in the vicinity of operations which constitute a fire hazard, and shall be conspicuously posted: "No smoking or open flame."

(d) Portable battery powered lighting equipment, used in connection with the storage, handling, or use of flammable gases or liquids, shall be of the type approved for the hazardous locations.

(e) The nozzle of air, inert gas, and steam lines or hoses, when used in the cleaning or ventilation of tanks and vessels that contain hazardous concentrations of flammable gases or vapors, shall be bonded to the tank or vessel shell. Bonding devices shall not be attached or detached in hazardous concentrations of flammable gases or vapors.

(f) Workers shall not take open lights or open flames near or in an open sewer manhole, gas main, conduit or other similar place until the absence of explosive or harmful gases has been assured. Open lights or flames shall not be carried into areas and enclosures where flammable vapors or exposed low flash point solvents exist. Only approved and suitable protected lights shall be used.

(2) Temporary buildings.

(a) No temporary building shall be erected where it will adversely affect any means of exit.

(b) Temporary buildings, when located within another building or structure, shall be of either noncombustible construction or of combustible construction having a fire resistance of not less than 1 hour.

(c) Temporary buildings, located other than inside another building and not used for the storage, handling, or use of flammable or combustible liquids, flammable gases, explosives, or blasting agents, or similar hazardous occupancies, shall be located at a distance of not less than 10 feet from another building or structure. Groups of temporary buildings, not exceeding 2,000 square feet in aggregate, shall, for the purpose of this part, be considered a single temporary building.

(3) Open yard storage.

(a) Combustible materials shall be piled with due regard to the stability of piles and in no case higher than 20 feet.

(b) Driveways between and around combustible storage piles shall be at least 15 feet wide and maintained free from accumulation of rubbish, equipment, or other articles or materials. Driveways shall be so spaced that a maximum grid system unit of 50 feet by 150 feet is produced.

(c) The entire storage site shall be kept free from accumulation of unnecessary combustible materials. Weeds and grass shall be kept down and a regular procedure provided for the periodic cleanup of the entire area.

(d) When there is a danger of an underground fire, that land shall not be used for combustible or flammable storage.

(e) Method of piling shall be solid wherever possible and in orderly and regular piles. No combustible material shall be stored outdoors within 10 feet of a building or structure.

(f) Portable fire extinguishing equipment, suitable for the fire hazard involved, shall be provided at convenient, conspicuously accessible locations in the yard area. Portable fire extinguishers, rated not less than 2A, shall be placed so that maximum travel distance to the nearest unit shall not exceed 100 feet.

(4) Indoor storage.

(a) Storage shall not obstruct, or adversely affect, means of exit.

(b) All materials shall be stored, handled, and piled with due regard to their fire characteristics.

(c) Noncompatible materials, which may create a fire hazard, shall be segregated by a barrier having a fire resistance of at least 1 hour.

(d) Material shall be piled to minimize the spread of fire internally and to permit convenient access for fire-fighting. Stable piling shall be maintained at all times. Aisle space shall be maintained to safely accommodate the widest vehicle that may be used within the building for fire-fighting purposes.

(e) Clearance of at least 36 inches shall be maintained between the top level of the stored material and the sprinkler deflectors.

(f) Clearance shall be maintained around lights and heating units to prevent ignition of combustible materials.

(g) A clearance of 24 inches shall be maintained around the path of travel of fire doors unless a barricade is provided, in which case no clearance is needed. Material shall not be stored within 36 inches of a fire door opening.

[Statutory Authority: Chapter 49.17 RCW. 88-23-054 (Order 88-25), § 296-155-265, filed 11/14/88; Order 74-26, § 296-155-265, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-270 Flammable and combustible liquids. (1) General requirements.**

(a) Only approved containers and portable tanks shall be used for storage and handling of flammable and combustible liquids. Approved metal safety cans shall be used for the handling and use of flammable liquids in quantities greater than one gallon, except that this shall not apply to those flammable liquid materials which are highly viscid highly (extremely hard to pour), which may be used and handled in original shipping containers. For quantities of one gallon or less, only the original container or approved metal safety cans shall be used for storage, use, and handling of flammable liquids.

(b) Flammable or combustible liquids shall not be stored in areas used for exits, stairways, or normally used for the safe passage of people.

(c) Flammable and combustible liquid containers shall be legibly marked to indicate their contents. Each storage container for flammable or combustible liquids, with a capacity of 50 gallons or more, shall have the contents of the container identified by a sign of clearly visible contrasting colors with letters at least 3 inches high, painted on the container at the discharge valve and at the fill point.

(d) Gasoline shall not be used as a solvent or a cleaning agent.

**(2) Indoor storage of flammable and combustible liquids.**

(a) No more than 25 gallons of flammable or combustible liquids shall be stored in a room outside of an approved storage cabinet. For storage of liquid petroleum gas, see WAC 296-155-275.

(b) Quantities of flammable and combustible liquid in excess of 25 gallons shall be stored in an acceptable or approved cabinet meeting the following requirements:

(i) Acceptable wooden storage cabinets shall be constructed in the following manner, or equivalent: The bottom, sides, and top shall be constructed of an exterior grade of plywood at least 1 inch in thickness, which shall not break down or delaminate under standard fire test conditions. All joints shall be rabbeted and shall be fastened in two directions with flathead wood screws, when more than one door is used, there shall be a rabbeted overlap of not less than 1 inch. Steel hinges shall be mounted in such a manner as to not lose their holding capacity due to loosening or burning out of the screws when subjected to fire. Such cabinets shall be painted inside and out with fire retardant paint.

(ii) Approved metal storage cabinets will be acceptable.

(iii) Cabinets shall be labeled in conspicuous lettering, "Flammable—Keep fire away."

(c) Not more than 60 gallons of flammable or 120 gallons of combustible liquids shall be stored in any one storage cabinet. Not more than three such cabinets may be located in a single storage area. Quantities in excess of this shall be stored in an inside storage room.

(d)(i) Inside storage room shall be constructed to meet the required fire-resistive rating for their use. Such construction shall comply with the test specifications set forth in Standard Methods of Fire Test of Building Construction and Material, NFPA 251-1972.

(ii) Where an automatic extinguishing system is provided, the system shall be designed and installed in an approved manner. Openings to other rooms or buildings shall be provided with noncombustible liquid-tight raised sills or ramps at least 4 inches in height, or the floor in the storage area shall be at least 4 inches below the surrounding floor. Openings shall be provided with approved self-closing fire doors. The room shall be liquid-tight where the walls join the floor. A permissible alternate to the sill or ramp is an open-grated trench, inside of the room, which drains to a safe location. Where other portions of the building or other buildings are exposed, windows shall be protected as set forth in the Standard for Fire Doors and Windows, NFPA No. 80-1983, for Class E or F openings. Wood of at least 1-inch nominal thickness may be used for shelving, racks, dunnage, scuffboards, floor overlay and similar installations.

(iii) Materials which will react with water and create a fire hazard shall not be stored in the same room with flammable or combustible liquids.

(iv) Storage in inside storage rooms shall comply with Table D-2 following:

TABLE D-2

Fire protection provided	Fire resistance	Maximum size	Total allowable quantities gals./sq. ft./floor area
Yes	2 hrs.	500 sq. ft.	10
No	2 hrs.	500 sq. ft.	4
Yes	1 hr.	150 sq. ft.	5
No	1 hr.	150 sq. ft.	2

Note: Fire protection system shall be sprinkler, water spray, carbon dioxide or other system approved by a nationally recognized testing laboratory for this purpose.

(v) Electrical wiring and equipment located in inside storage rooms shall be approved for Class 1, Division 1, hazardous locations. For definition of Class 1, Division 1, hazardous locations, see WAC 296-155-456.

(vi) Every inside storage room shall be provided with either a gravity or a mechanical exhausting system. Such

system shall commence not more than 12 inches above the floor and be designed to provide for a complete change of air within the room at least 6 times per hour. If a mechanical exhausting system is used, it shall be controlled by a switch located outside of the door. The ventilating equipment and any lighting fixtures shall be operated by the same switch. An electric pilot light shall be installed adjacent to the switch if flammable liquids are dispensed within the room. Where gravity ventilation is provided, the fresh air intake, as well as the exhausting outlet from the room, shall be on the exterior of the building in which the room is located.

(vii) In every inside storage room there shall be maintained one clear aisle at least 3 feet wide. Containers over 30 gallons capacity shall not be stacked one upon the other.

(viii) Flammable and combustible liquids in excess of that permitted in inside storage rooms shall be stored outside of buildings in accordance with subsection (3) of this section.

(3) Storage outside buildings.

(a) Storage of containers (not more than 60 gallons each) shall not exceed 1,100 gallons in any one pile or area. Piles or groups of containers shall be separated by a 5-foot clearance. Piles or groups of containers shall not be nearer than 20 feet to a building.

(b) Within 200 feet of each pile of containers, there shall be a 12-foot-wide access way to permit approach of fire control apparatus.

(c) The storage area shall be graded in a manner to divert possible spills away from buildings or other exposures, or shall be surrounded by a curb or earth dike at least 12 inches high. When curbs or dikes are used, provisions shall be made for draining off accumulations of ground or rain water, or spills of flammable or combustible liquids. Drains shall terminate at a safe location and shall be accessible to operation under fire conditions.

(d) Outdoor portable tank storage.

(i) Portable tanks shall not be nearer than 20 feet from any building. Two or more portable tanks, grouped together, having a combined capacity in excess of 2,200 gallons, shall be separated by a 5-foot-clear area. Individual portable tanks exceeding 1,100 gallons shall be separated by a 5-foot-clear area.

(ii) Within 200 feet of each portable tank, there shall be a 12-foot-wide access way to permit approach of fire control apparatus.

(e) Storage areas shall be kept free of weeds, debris, and other combustible material not necessary to the storage.

(f) Portable tanks, not exceeding 660 gallons, shall be provided with emergency venting and other devices, as required by chapters III and IV of NFPA 30-1972, The Flammable and Combustible Liquids Code.

(g) Portable tanks, in excess of 660 gallons, shall have emergency venting and other devices, as required by chapters II and III of the Flammable and Combustible Liquids Code, NFPA 30-1972.

(4) Fire control for flammable or combustible liquid storage.

(a) At least one portable fire extinguisher, having a rating of not less than 20-B units, shall be located outside of, but not more than 10 feet from, the door opening into any room used for storage of more than 60 gallons of flammable or combustible liquids.

(b) At least one portable fire extinguisher having a rating of not less than 20-B units shall be located not less than 25 feet, nor more than 75 feet, from any flammable liquid storage area located outside.

(c) When sprinklers are provided, they shall be installed in accordance with the Standard for the Installation of Sprinkler Systems, NFPA 13-1972.

(d) At least one portable fire extinguisher having a rating of not less than 20-B:C units shall be provided on all tank trucks or other vehicles used for transporting and/or dispensing flammable or combustible liquids.

(5) Dispensing liquids.

(a) Areas in which flammable or combustible liquids are transferred at the same time, in quantities greater than 5 gallons from one tank or container to another tank or container, shall be separated from other operations by 25-foot distance or by construction having a fire-resistance of at least 1 hour. Drainage or other means shall be provided to control spills. Adequate natural or mechanical ventilation shall be provided to maintain the concentration of flammable vapor at or below 10 percent of the lower flammable limit.

(b) Transfer flammable liquids from one container to another shall be done only when containers are electrically interconnected (bonded).

(c) Flammable or combustible liquids shall be drawn from or transferred into vessels, containers, or tanks within a building or outside only through a closed piping system, from safety cans, by means of a device drawing through the top, or from a container, or portable tanks, by gravity or pump, through an approved self-closing valve. Transferring by means of air pressure on the container or portable tank is prohibited.

(d) The dispensing units shall be protected against collision damage.

(e) Dispensing devices and nozzles for flammable liquids shall be of an approved type, as required by WAC 296-24-33015.

(6) Handling liquids at point of final use.

(a) Flammable liquids shall be kept in closed containers when not actually in use.

(b) Leakage or spillage of flammable or combustible liquids shall be disposed of promptly and safely.

(c) Flammable liquids shall be used only where there are no open flames or other sources of ignition within 50 feet of the operation, unless conditions warrant greater clearance.

(7) Service and refueling areas.

(a) Flammable or combustible liquids shall be stored in approved closed containers, in tanks located underground, or in aboveground portable tanks.

(b) The tank trucks shall comply with the requirements covered in the Standard for Tank Vehicles for Flammable and Combustible Liquids, NFPA No. 385-1977.

(c) The dispensing hose shall be an approved type.



(d) The dispensing nozzle shall be an approved automatic-closing type.

(e) Underground tanks shall not be abandoned.

(f) Clearly identified and easily accessible switch(es) shall be provided at a location remote from dispensing devices to shut off the power to all dispensing devices in the event of an emergency.

(g)(i) Heating equipment of an approved type may be installed in the lubrication or service area where there is no dispensing or transferring of flammable liquids, provided the bottom of the heating unit is at least 18 inches above the floor and is protected from physical damage.

(ii) Heating equipment installed in lubrication or service areas, where flammable liquids are dispensed, shall be of an approved type for garages, and shall be installed at least 8 feet above the floor.

(h) There shall be no smoking or open flames in the areas used for fueling, servicing fuel systems for internal combustion engines, receiving or dispensing of flammable or combustible liquids.

(i) Conspicuous and legible signs prohibiting smoking shall be posted.

(j) The motor of any equipment being fueled shall be shut off during the fueling operation.

(k) Each service or fueling area shall be provided with at least one fire extinguisher having a rating of not less than 20BC located so that an extinguisher will be within 75 feet of each pump, dispenser, underground fill pipe opening, and lubrication or service area.

[Statutory Authority: Chapter 49.17 RCW. 88-23-054 (Order 88-25), § 296-155-270, filed 11/14/88. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-270, filed 1/21/86; Order 74-26, § 296-155-270, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-275 Liquefied petroleum gas (LP-gas).** (1) Approval of equipment and systems.

(a) Each system shall have containers, valves, connectors, manifold valve assemblies, and regulators of an approved type.

(b) All cylinders shall meet the department of transportation specification identification requirements published in 49 CFR Part 178, Shipping Container Specifications.

(2) Welding on LP-gas containers. Welding is prohibited on containers.

(3) Container valves and container accessories.

(a) Valves, fittings, and accessories connected directly to the container, including primary shut off valves, shall have a rated working pressure of at least 250 p.s.i.g. and shall be of material and design suitable for LP-gas service.

(b) Connections to containers, except safety relief connections, liquid level gauging devices, and plugged openings, shall have shutoff valves located as close to the container as practicable.

(4) Safety devices.

(a) Every container and every vaporizer shall be provided with one or more approved safety relief valves or devices. These valves shall be arranged to afford free vent to the outer air with discharge not less than 5 feet

horizontally away from any opening into a building which is below such discharge.

(b) Shutoff valves shall not be installed between the safety relief device and the container, or the equipment or piping to which the safety relief device is connected, except that a shutoff valve may be used where the arrangement of this valve is such that full required capacity flow through the safety relief device is always afforded.

(c) Container safety relief devices and regulator relief vents shall be located not less than 5 feet in any direction from air openings into sealed combustion system appliances or mechanical ventilation air intakes.

(5) Dispensing.

(a) Filling of fuel containers for trucks or motor vehicles from bulk storage containers shall be performed not less than 10 feet from the nearest masonry-walled building, or not less than 25 feet from the nearest building or other construction and, in any event, not less than 25 feet from any building opening.

(b) Filling of portable containers or containers mounted on skids from storage containers shall be performed not less than 50 feet from the nearest building.

(6) Requirements for appliances.

(a) LP-gas consuming appliances shall be approved types.

(b) Any appliance that was originally manufactured for operation with a gaseous fuel other than LP-gas, and is in good condition, may be used with LP-gas only after it is properly converted, adapted, and tested for performance with LP-gas before the appliance is placed in use.

(7) Containers and regulating equipment installed outside of buildings or structures. Containers shall be upright upon firm foundations or otherwise firmly secured. The possible effect on the outlet piping of settling shall be guarded against by a flexible connection or special fitting.

(8) Containers and equipment used inside of buildings or structures.

(a) When operational requirements make portable use of containers necessary, and their location outside of buildings or structures is impractical, containers and equipment are permitted to be used inside of buildings or structures in accordance with (b) through (k) of this subsection. In addition, there may be provisions of this section that are applicable to the particular use or occupancy.

(b) "Containers in use" means connected for use.

(c) Systems utilizing containers having a water capacity greater than 2 1/2-pounds (nominal 1 pound LP-gas capacity) shall be equipped with excess flow valves. Such excess flow valves shall be either integral with the container valves or in the connections to the container valve outlets.

(d) Regulators, when required, shall be either directly connected to the container valves or to manifolds connected to the container valves. The regulator shall be suitable for use with LP-gas. Manifolds and fittings connecting containers to pressure regulator inlets shall be designed for at least 250 p.s.i.g. service pressure.



(e) Valves on containers having water capacity greater than 50 pounds (nominal 20 pounds LP-gas capacity) shall be protected from damage while in use or storage.

(f) Aluminum piping or tubing shall not be used.

(g) Hose shall be designed for a working pressure of at least 250 p.s.i.g. Design, construction, and performance of hose, and hose connections shall have their suitability determined by listing by a nationally recognized testing agency. The hose length shall be as short as practical. Hoses shall be long enough to permit compliance with spacing provisions of (a) through (m) of this subsection, without kinking or straining, or causing hose to be so close to a burner as to be damaged by heat.

(h) Portable heaters, including salamanders, shall be equipped with an approved automatic device to shut off the flow of gas to the mainburner, and pilot if used, in the event of flame failure. Such heaters, having inputs above 50,000 BTU per hour, shall be equipped with either a pilot, which must be lighted and proved before the main burner can be turned on, or an electrical ignition system.

Note: The provisions of this subdivision do not apply to portable heaters under 7,500 BTU per hour input when used with containers having a maximum water capacity of 2 1/2 pounds.

(i) Container valves, connectors, regulators, manifolds, piping, and tubing shall not be used as structural supports for heaters.

(j) Containers, regulating equipment, manifolds, pipe, tubing, and hose shall be located to minimize exposure to high temperatures or physical damage.

(k) Containers having a water capacity greater than 2 1/2 pounds (nominal 1 pound LP-gas capacity) connected for use shall stand on a firm and substantially level surface and, when necessary, shall be secured in an upright position.

(l) The maximum water capacity of individual containers shall be 245 pounds (nominal 100 pounds LP-gas capacity).

(m) For temporary heating, heaters (other than integral heater-container units) shall be located at least 6 feet from any LP-gas container. This shall not prohibit the use of heaters specifically designed for attachment to the container or to a supporting standard, provided they are designed and installed so as to prevent direct or radiant heat application from the heater onto the containers. Blower and radiant type heaters shall not be directed toward any LP-gas container within 20 feet.

(n) If two or more heater-container units, of either the integral or nonintegral type, are located in an unpartitioned area on the same floor, the container or containers of each unit shall be separated from the container or containers of any other unit by at least 20 feet.

(o) When heaters are connected to containers for use in an unpartitioned area on the same floor, the total water capacity of containers, manifolded together for connection to a heater or heaters, shall not be greater than 735 pounds (nominal 300 pounds LP-gas capacity). Such manifolds shall be separated by at least 20 feet.

(p) Storage of containers awaiting use shall be in accordance with subsections (10) and (11) of this section.

(9) Multiple container systems.

(a) Valves in the assembly of multiple container systems shall be arranged so that replacement of containers can be made without shutting off the flow of gas in the system. This provision is not to be construed as requiring an automatic changeover device.

(b) Heaters shall be equipped with an approved regulator in the supply line between the fuel cylinder and the heater unit. Cylinder connectors shall be provided with an excess flow valve to minimize the flow of gas in the event the fuel line becomes ruptured.

(c) Regulators and low-pressure relief devices shall be rigidly attached to the cylinder valves, cylinders, supporting standards, the building walls, or otherwise rigidly secured, and shall be so installed or protected from the elements.

(10) Storage of LPG containers. Storage of LPG within building is prohibited.

(11) Storage outside of buildings.

(a) Storage outside of buildings, for containers awaiting use, shall be located from the nearest building or group of buildings, in accordance with Table D-3:

TABLE D-3

Quantity of LP-gas stored:	Distance (feet)
500 lbs. or less _____	0
501 to 6,000 lbs. _____	10
6,001 to 10,000 lbs. _____	20
Over 10,000 lbs. _____	25

(b) Containers shall be in a suitable ventilated enclosure or otherwise protected against tampering, or possible damage by vehicular traffic.

(12) Fire protection. Storage locations shall be provided with at least one approved portable fire extinguisher having a rating of not less than 20-B:C.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-275, filed 1/21/86; Order 76-29, § 296-155-275, filed 9/30/76; Order 74-26, § 296-155-275, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-280 Temporary heating devices. (1) Ventilation.**

(a) Fresh air shall be supplied in sufficient quantities to maintain the health and safety of workers. Where natural means of fresh air supply is inadequate, mechanical ventilation shall be provided.

(b) When heaters are used in confined spaces, special care shall be taken to provide sufficient ventilation in order to ensure proper combustion, maintain the health and safety of workers, and limit temperature rise in the area.

(2) Clearance and mounting.

(a) Temporary heating devices shall be installed to provide clearance to combustible material not less than the amount shown in Table D-4.

(b) Temporary heating devices, which are listed for installation with lesser clearances than specified in Table D-4, may be installed in accordance with their approval.

TABLE D-4

Heating appliances	Minimum clearance, (inches)		
	Sides	Rear	Chimney connector
Room heater, circulating type	12	12	18
Room heater, radiant type	36	36	18

(c) Heaters not suitable for use on wood floors shall not be set directly upon them or other combustible materials. When such heaters are used, they shall rest on suitable heat insulating material or at least 1-inch concrete, or equivalent. The insulating material shall extend beyond the heater 2 feet or more in all directions.

(d) Heaters used in the vicinity of combustible tarpaulins, canvas, or similar coverings shall be located at least 10 feet from the coverings. The coverings shall be securely fastened to prevent ignition or upsetting of the heater due to wind action on the covering or other material.

(3) Stability. Heaters, when in use, shall be set horizontally level, unless otherwise permitted by the manufacturer's markings.

(4) Oil-fired heaters.

(a) Flammable liquid-fired heaters shall be equipped with a primary safety control to stop the flow of fuel in the event of flame failure. Barometric or gravity oil feed shall not be considered a primary safety control.

(b) Heaters designed for barometric or gravity oil feed shall be used only with the integral tanks.

(c) Heaters specifically designed and approved for use with separate supply tanks may be directly connected for gravity feed, or an automatic pump, from a supply tank.

(5) Salamanders.

(a) Coverage. The use of solid fuel salamanders is prohibited in buildings and on scaffolds.

(b) General requirements.

(i) All solid fuel salamanders shall be designed and constructed for use with solid fuel, that is, coal or coke.

(ii) Solid fuel salamanders shall be equipped with a cover designed as part of the unit, to prevent spillage of burning material in case of tipover.

(iii) Salamanders shall be assembled in accordance with the instructions issued by the manufacturer.

(iv) The safeguards engineered into the product shall be maintained and any replacement shall be equivalent thereto.

(v) Salamanders shall be stored in such a manner as to prevent deterioration or damage to the unit.

(c) Operation.

(i) Manufacturers' instructions shall be followed by the user.

(ii) Each time a salamander is placed in operation it shall be checked to insure that it is functioning properly. Its operation shall be checked periodically thereafter.

(iii) When concentrations of carbon monoxide attain quantities greater than 50 parts per million (0.005 percent) to air volume at employee breathing levels, the salamander shall be extinguished unless additional natural or mechanical ventilation is provided to reduce the carbon monoxide content to permissible limits.

(iv) Tests for presence of carbon monoxide shall be made by a qualified person within 1 hour after the start of each shift and at least every 3 hours thereafter. If concentrations of carbon monoxide reach 30 parts per million to air volume, tests shall be made more frequently to determine if there is a continuing increase of carbon monoxide concentration.

(v) Records of all tests including the date, time, results obtained, and person making tests, shall be maintained for the duration of the project.

(vi) No persons shall be permitted to be within the area being heated by the salamanders except under the following circumstances: When tending the salamanders; when testing the atmosphere; or in emergency situations.

(vii) No employee shall be permitted to enter the heated area until notification is given to another person located outside. Periodic checks shall be made to ensure the health and safety of employees entering the heated area.

(viii) When a salamander is being used, the responsibility for its operation and maintenance shall be assigned to a qualified employee.

(ix) Salamanders shall not be moved, handled, or serviced while hot or burning, or while component parts are hot to the touch.

(x) Salamanders, when in use, shall be set level with the horizontal unless otherwise permitted by the manufacturer's markings. Salamanders shall be designed so as not to tip over when placed on a surface inclined 25° to the horizontal.

(xi) If equivalent protection and safety is afforded by alternative design, the 25° limitation may be reduced.

(xii) Salamanders not suitable for use on wood floors shall not be set directly upon them or other combustible materials. When such salamanders are used they shall rest on suitable insulating material or at least 1-inch concrete or equivalent. The insulating material shall extend beyond the salamander 2 feet or more in all directions.

(xiii) Salamanders used in the vicinity of tarpaulins, canvas, or similar coverings shall be located a safe distance from coverings and other combustible materials. The coverings shall be securely fastened to prevent ignition of the covering or upsetting of the salamanders due to wind action on the covering or other material.

(xiv) Salamanders in use shall be protected to prevent flame extinguishment.

(d) Ventilation.

(i) Fresh air shall be supplied in sufficient quantities to maintain the health and safety of employees. Where natural means for fresh air supply is inadequate, mechanical ventilation shall be provided. Particular attention shall be given to confined spaces and pockets where heat and fumes may accumulate and employees may be present (roof areas, peaks, basement).

(ii) When salamanders are used in confined spaces, special care shall be taken to provide sufficient ventilation in order to assure proper combustion, maintain the health and safety of employees, and limit temperature rise in the area.

(e) Fueling.

(i) Salamanders shall be refueled only by a person trained in such operations.

(ii) Only a 1 day's supply of heater fuel shall be stored inside a building in the vicinity of the salamander. General fuel storage shall be outside the structure.

(iii) All fuel storage shall be maintained a minimum of 25 feet from source of ignition.

(f) Maintenance.

(i) The user shall comply with the maintenance instructions as provided by the manufacturer.

(ii) Equipment showing evidence of deterioration or damage that constitutes a safety or health hazard shall be removed from service.

(iii) Salamander repairs shall be performed in accordance with the manufacturer's recommendations, and replacement parts shall be equal to, the equivalent of, or the same as the original salamander equipment.

[Order 76-29, § 296-155-280, filed 9/30/76; Order 74-26, § 296-155-280, filed 5/7/74, effective 6/6/74.]

**Part E**

**SIGNS, SIGNALS, AND BARRICADES**

**WAC**

- 296-155-300 Accident prevention signs and tags.
- 296-155-305 Signaling.
- 296-155-310 Barricades.
- 296-155-315 Definitions applicable to this part.

**WAC 296-155-300 Accident prevention signs and tags.** (1) General. Signs and symbols required by this section shall be visible at all times when work is being performed, and shall be removed or covered promptly when the hazards no longer exist.

(2) Danger signs.

(a) Danger signs (see Figure E-1) shall be used only where an immediate hazard exists.

(b) Danger signs shall have red as the predominating color for the upper panel; black outline on the borders; and a white lower panel for additional sign wording.

(3) Caution signs.

(a) Caution signs (see Figure E-2) shall be used only to warn against potential hazards or to caution against unsafe practices.

(b) Caution signs shall have yellow as the predominating color; black upper panel and borders; yellow lettering of "caution" on the black panel; and the lower yellow panel for additional sign wording. Black lettering shall be used for additional wording.



FIGURE E-1

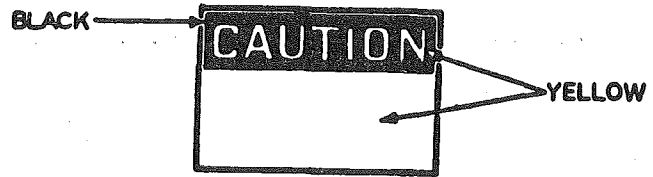


FIGURE E-2

(4) Exit signs.

(a) Every exit sign shall have the word "exit" in plainly legible letters not less than 6 inches high, with the principal strokes of letters not less than three-fourths-inch wide.

(b) Every exit sign shall be distinctive in color and shall provide contrast with decorations, interior finish, or other signs.

(5) Safety instruction signs. Safety instruction signs, when used, shall be white with green upper panel with white letters to convey the principal message. Any additional wording on the sign shall be black letters on the white background.

(6) Directional signs. Directional signs, other than automotive traffic signs specified in subsection (7) of this section, shall be white with a black panel and a white directional symbol. Any additional wording on the sign shall be black letters on the white background.

(7) Traffic signs.

(a) Construction areas shall be posted with legible traffic signs at points of hazard.

(b) All traffic control signs or devices used for protection of construction workers shall conform to American National Standards Institute D6.1-1978, Manual on Uniform Traffic Control Devices for Streets and Highways as amended by the Washington state department of transportation (M24-OT (HT)).

(8) Accident prevention tags.

(a) Accident prevention tags shall be used as a temporary means of warning employees of an existing hazard, such as defective tools, equipment, etc. They shall not be used in place of, or as a substitute for, accident prevention signs.

(b) Specifications for accident prevention tags similar to those in Table E-1 shall apply.

(i) Additional rules. American National Standards Institute (ANSI) Z35.1-1972, Specifications for Accident Prevention signs, and Z35.2-1968, Specifications

for Accident Prevention Tags, contain rules which are additional to the rules prescribed in this section. The employer shall comply with ANSI Z35.1-1972 and Z35.2-1968 with respect to rules not specifically prescribed in this part.

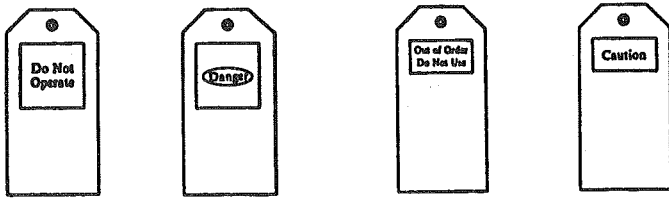


TABLE E-1

White tag— White letters on red square	White tag— White letters on red oval with a black square	Yellow tag— Yellow letters on a black background	White tag— White letters on black background
Basic Stock (Background)	Safety Colors (Ink)	Copy Specification (Letters)	
White	Red	Do Not Operate	
White	Black and Red	Danger	
Yellow	Black	Caution	
White	Black	Out of Order— Do Not Use	

[Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-300, filed 1/21/86; Order 74-26, § 296-155-300, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-305 Signaling. Flaggers.**

(1) When operations are such that signs, signals, and barricades do not provide the necessary protection on or adjacent to a highway or street, flaggers or other appropriate traffic controls shall be provided.

(2) Signaling directions by flaggers shall conform to American National Standards Institute D6.1-1978, Manual on Uniform Traffic Control Devices for Streets and Highways, as amended by the Washington state department of transportation. (M24-01 (HT).)

(3) Hand signaling by flaggers shall be by use of sign paddles at least 18 inches in diameter with series "C" letters at least 6 inches high or lights approved by the transportation commission. When hand signaling is done in periods of darkness, the sign paddles must be reflectorized or illuminated as required by ANSI D6.1-1978, Manual on Uniform Traffic Control Devices. The "STOP" side of the paddle shall have a red background with white lettering. When a paddle has a "SLOW" side, the background shall be orange and the lettering black. Colors shall conform to ANSI D6.1 current edition.

(4) Flaggers shall wear an orange warning garment and a yellow protective helmet while flagging. Warning garments worn at night shall be of reflectorized material. Yellow is specified as the color of helmets; the issue is clearly one of high visibility. Other colors providing equal visibility than the specified yellow will be acceptable. The iridescent or reflectorized hard hats, available in several colors, which provide "high visibility" in both day and night applications, will meet standard specifications.

(5) Each flagger shall have in their possession a valid certificate of completion of an approved flagging course.

Note: Personnel that have not completed a flagging course may be assigned duties as flaggers only during emergencies when a sudden, generally unexpected, set of circumstances demands immediate attention.

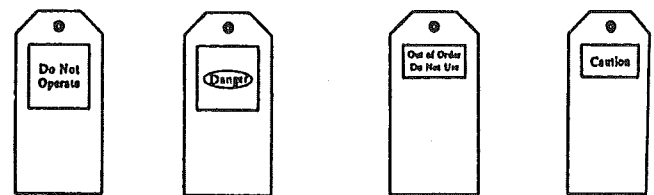


TABLE E-1

White tag— White letters on red square	White tag— White letters on red oval with a black square	Yellow tag— Yellow letters on a black background	White tag— White letters on black background
Basic Stock (Background)	Safety Colors (Ink)	Copy Specification (Letters)	
White	Red	Do Not Operate	
White	Black and Red	Danger	
Yellow	Black	Caution	
White	Black	Out of Order— Do Not Use	

[Statutory Authority: Chapter 49.17 RCW. 89-11-035 (Order 89-03), § 296-155-305, filed 5/15/89, effective 6/30/89. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-305, filed 1/21/86; Order 76-6, § 296-155-305, filed 3/1/76; Order 74-26, § 296-155-305, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-310 Barricades.** Barricades for protection of employees shall conform to the portions of the American National Standards Institute D6.1-1971, Manual on Uniform Traffic Control Devices for Streets and Highways, as amended by the Washington state department of highways, (M24-01 (HT)), relating to barricades.

[Order 74-26, § 296-155-310, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-315 Definitions applicable to this part.** (1) "Barricade" means an obstruction to deter the passage of persons or vehicles.

(2) "Signs" are the warnings of hazard, temporarily or permanently affixed or placed, at locations where hazards exist.

(3) "Signals" are moving signs, provided by workers, such as flagmen, or by devices, such as flashing lights, to warn of possible or existing hazards.

(4) "Tags" are temporary signs, usually attached to a piece of equipment or part of a structure, to warn of existing or immediate hazards.

[Order 76-6, § 296-155-315, filed 3/1/76.]

## Part F

### MATERIAL HANDLING, STORAGE, USE AND DISPOSAL

#### WAC

296-155-325	General requirements for storage.
296-155-330	Rigging equipment for material handling.
296-155-335	Disposal of waste materials.
296-155-34901	Table F-1.
296-155-34902	Table F-2.
296-155-34903	Table F-3.
296-155-34904	Table F-4.
296-155-34905	Table F-5.
296-155-34906	Table F-6.
296-155-34907	Table F-7.
296-155-34908	Table F-8.
296-155-34909	Table F-9.
296-155-34910	Table F-10.
296-155-34911	Table F-11.
296-155-34912	Table F-12.
296-155-34913	Table F-13.
296-155-34914	Table F-14.
296-155-34915	Table F-15.
296-155-34916	Table F-16.
296-155-34917	Table F-17.
296-155-34918	Table F-18.
296-155-34919	Table F-19.
296-155-34920	Table F-20.

**WAC 296-155-325 General requirements for storage.** (1) General.

(a) All materials stored in tiers shall be stacked, racked, blocked, interlocked, or otherwise secured to prevent sliding, falling or collapse.

(b) Maximum safe load limits of floors within buildings and structures, in pounds per square foot, shall be conspicuously posted in all storage areas, except for floor or slab on grade. Maximum safe loads shall not be exceeded.

(c) Aisles and passageways shall be kept clear to provide for the free and safe movement of material handling equipment or employees. Such areas shall be kept in good repair.

(d) When a difference in road or working levels exist, means such as ramps, blocking, or grading shall be used to ensure the safe movement of vehicles between the two levels.

(2) Material storage.

(a)(i) Material stored inside buildings under construction shall not be placed within 6 feet of any hoistway or inside floor openings, nor within 10 feet of an

exterior wall which does not extend above the top of the material stored.

(ii) Temporary floors, used in steel erection, concrete forms and shoring (i.e., stripped forms, shoring jacks, clamps, steel rods or pipes, base plates, etc.) placed within close proximity to an open-sided floor for movement to another tier for placement, shall be considered "in-process equipment and subject to the provisions contained in Parts "O" and "P" of this standard. When this type equipment is to be left overnight or for longer periods of time it shall be anchored and braced to prevent displacement in any direction. In addition this equipment shall be subject to the provisions of this subsection while in "interim storage."

(b) Employees required to work on stored material in silos, hoppers, tanks, and similar storage areas shall be equipped with lifelines and safety belts meeting the requirements of WAC 296-155-225, Part C.

(c) Noncompatible materials shall be segregated in storage.

(d) Bagged materials shall be stacked by stepping back the layers and cross-keying the bags at least every 10 bags high.

(i) When cement and lime is delivered in paper bags they shall be carefully handled to prevent the bags bursting.

(ii) Cement and lime bags shall not be piled more than ten bags high except when stored in bins or enclosures built for the purpose of storage.

(iii) When bags are removed from the pile, the length of the pile shall be kept at an even height, and the necessary step backs every five bags maintained.

(iv) Persons handling cement and lime bags shall wear eye protection which prevents contact between the substance and the worker's eyes (such as goggles or other sealed eye protection) and shall wear long sleeve shirts with close fitting collar and cuffs.

(v) Persons shall be warned against wearing clothing that has become hard and stiff with cement.

(vi) Persons shall be instructed to report any susceptibility of their skin to cement and lime burns.

(vii) A hand cream or vaseline and eye wash shall be provided and kept ready for use to prevent burns.

(viii) Lime shall be stored in a dry place to prevent a premature slacking action that may cause fire.

(e) Materials shall not be stored on scaffolds or runways in excess of supplies needed for immediate operations.

(f) Brick stacks shall not be more than 7 feet in height. When a loose brick stack reaches a height of 4 feet, it shall be tapered back 2 inches in every foot of height above the 4-foot level.

(i) Brick shall never be stacked, for storage purposes, on scaffolds or runways.

(ii) When delivering brick on scaffolds inside the wall lines in wheelbarrows, they shall be dumped toward the inside of the building and not toward the wall.

(iii) Blocks shall always be stacked and not thrown in a loose pile.

(g) When masonry blocks are stacked higher than 6 feet, the stack shall be tapered back one-half block per tier above the 6-foot level.

(i) When blocks are stacked inside a building, the piles shall be so distributed as not to overload the floor on which they stand.

(ii) Blocks shall not be dropped or thrown from an elevation or delivered through chutes.

(h) Lumber:

(i) Used lumber shall have all nails withdrawn before stacking.

(ii) Lumber shall be stacked on level and solidly supported sills.

(iii) Lumber shall be so stacked as to be stable and self-supporting.

(iv) Lumber stacks shall not exceed 20 feet in height provided that lumber to be handled manually shall not be stacked more than 16 feet high.

(v) All stored lumber shall be stacked on timber sills to keep it off the grounds. Sills shall be placed level on solid supports.

(vi) Cross strips shall be placed in the stacks when they are stacked more than four feet high.

(i) Structural steel, poles, pipe, bar stock, and other cylindrical materials, unless racked, shall be stacked and blocked so as to prevent spreading or tilting.

(i) Persons handling reinforcing steel shall wear heavy gloves.

(ii) When bending of reinforcing steel is done on the job, a strong bench shall be provided, set up on even dry ground or a floor for the persons to work on.

(iii) Structural steel shall be carefully piled to prevent danger of members rolling off or the pile toppling over.

(iv) Structural steel shall be kept in low piles, consideration being given to the sequence of use of the members.

(v) Corrugated and flat iron shall be stacked in flat piles, with the piles not more than four feet high and spacing strips shall be placed between each bundle.

(j) Sand, gravel and crushed stone. Stock piles shall be frequently inspected to prevent their becoming unsafe by continued adding to or withdrawing from the stock.

(i) If material becomes frozen, it shall not be removed in a manner that would produce an overhang.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-325, filed 1/21/86; Order 74-26, § 296-155-325, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-330 Rigging equipment for material handling. (1) General.**

(a) Rigging equipment for material handling shall be inspected prior to use on each shift and as necessary during its use to ensure that it is safe. Defective rigging equipment shall be removed from service.

(b) Rigging equipment shall not be loaded in excess of its recommended safe working load, as prescribed in Tables F-1 through F-20 in this part and shall comply with ANSI B 30.9-1984.

(c) Rigging equipment, when not in use, shall be removed from the immediate work area so as not to present a hazard to employees.

(d) Special custom design grabs, hooks, clamps, or other lifting accessories shall be marked to indicate the safe working loads and shall be proof-tested to 125 percent of the rated load prior to use. Such custom devices shall be permanently marked with an identification number and permanent records shall be maintained on the jobsite for each device.

(2) Alloy steel chains. Chains used for overhead lifting shall be proof tested alloy steel.

(a) Welded alloy steel chain slings shall have permanently affixed durable identification stating size, grade, rated capacity, and sling manufacturer.

(b) Hooks, rings, oblong links, pear-shaped links, welded or mechanical coupling links, or other attachments, when used with alloy steel chains, shall have a rated capacity at least equal to that of the chain.

(c) The use of job or shop hooks and links, or make-shift fasteners, formed from bolts, rods, etc., or other such attachments, shall be prohibited.

(d) Rated capacity (working load limit) for alloy steel chain slings shall conform to the values shown in Table F-1.

(e) Whenever wear at any point of any chain link exceeds that shown in Table F-2, the assembly shall be removed from service.

(f) If at any time any three foot length of chain is found to have stretched one-third the length of a link it shall be discarded.

(g) The practice of placing bolts or nails between two links to shorten chains is prohibited.

(h) Splicing broken chains by inserting a bolt between two links with the heads of the bolt and the nut sustaining the load, or passing one link through another and inserting a bolt or nail to hold it, is prohibited.

(i) Wherever annealing of chains is attempted, it shall be done in properly equipped annealing furnaces and under the direct supervision of a competent person.

(3) Wire rope.

(a) Table F-3 through F-14 shall be used to determine the safe working loads of various sizes and classifications of improved plow steel wire rope and wire rope slings with various types of terminals. For sizes, classifications, and grades not included in these tables, the safe working load recommended by the manufacturer for specific, identifiable products shall be followed, provided that a safety factor of not less than 5 is maintained.

(b) Protruding ends of strands in splices on slings and bridles shall be covered or blunted.

(c) Wire rope shall not be secured by knots.

(d) The following limitations shall apply to the use of wire rope:

(i) An eye splice made in any wire rope shall have not less than three full tucks.

Note: This requirement shall not preclude the use of another form of splice or connection which can be shown to be as efficient and which is not otherwise prohibited.

(ii) Except for eye splices in the ends of wires and for endless rope slings, each wire rope used in hoisting or lowering, or in pulling loads, shall consist of one continuous piece without knot or splice.

(iii) Wire rope shall not be used, if in any length of eight diameters, the total number of visible broken wires exceeds 10 percent of the total number of wires, or if the rope shows other signs of excessive wear, corrosion, or defect.

(e) When U-bolt wire rope clips are used to form eyes, Table F-20 shall be used to determine the number and spacing of clips.

(f) When used for eye splices, the U-bolt shall be applied so that the "U" section is in contact with the dead end of the rope.

(g) U-Bolt wire rope clips shall be made of drop-forged steel.

Note: See Table F-20 for number of clamps and spacing requirements.

**CORRECT METHOD OF ATTACHING WIRE ROPE CLIPS**



U-Bolt of all clips on dead end of rope

(4) Natural rope, and synthetic fiber.

(a) General. When using natural or synthetic fiber rope slings, Tables F-15, F-16, F-17 and F-18 shall apply.

(b) All splices in rope slings provided by the employer shall be made in accordance with fiber rope manufacturers' recommendations.

(i) In manila rope, eye splices shall contain at least three full tucks, and short splices shall contain at least six full tucks (three on each side of the centerline of the splice).

(ii) In layed synthetic fiber rope, eye splices shall contain at least four full tucks, and short splices shall contain at least eight full tucks (four on each side of the centerline of the splice).

(iii) Strand end tails shall not be trimmed short (flush with the surface of the rope) immediately adjacent to the full tucks. This precaution applies to both eye and short splices and all types of fiber rope. For fiber ropes under 1-inch diameter, the tails shall project at least six rope diameters beyond the last full tuck. For fiber ropes 1-inch diameter and larger, the tails shall project at least 6 inches beyond the last full tuck. In applications where the projecting tails may be objectionable, the tails shall be tapered and spliced into the body of the rope using at least two additional tucks (which will require a tail length of approximately six rope diameters beyond the last full tuck).

(iv) For all eye splices, the eye shall be sufficiently large to provide an included angle of not greater than 60° at the splice when the eye is placed over the load or support.

(v) Knots shall not be used in lieu of splices.

(vi) All fibre rope used for hoisting purposes or for the support of scaffolds, or any part thereof, shall be of

high grade Manila hemp (abaca). Fibre rope used for the support of scaffolds, or any part thereof, except rope used for lashing or tying purposes, shall be not less than 3/4-inch in diameter.

(vii) The maximum safe working load for fibre rope shall not exceed the maximum strength as shown in the following table:

**STRENGTH OF HIGH GRADE MANILA (ABACA) ROPE  
COMMON LAY THREE STRAND**

Approximate Diameter in inches	Circumference in inches	Safe Load in Pounds
3/16 (6 yarns)	1/2	98
1/4 (6 yarns)	3/4	116
5/16 (6 yarns)	1	200
3/8 (12 yarns)	1 1/8	241
7/16 (15 yarns)	1 1/4	291
15/32 (18 yarns)	1 3/8	350
1/2 (21 yarns)	1 1/2	408
9/16	1 3/4	526
5/8	2	666
3/4	2 1/4	816
13/16	2 1/2	983
7/8	2 3/4	1,166
1	3	1,366
1 1/16	3 1/4	1,683
1 1/8	3 1/2	1,833
1 1/4	3 3/4	2,083
1 5/16	4	2,365
1 3/8	4 1/4	2,666
1 1/2	4 1/2	2,916

Note: This table is based on data contained in the U.S. Department of Commerce circular of the Bureau of Standards, No. 324.

(5) Synthetic webbing (nylon, polyester, and polypropylene).

(a) The employer shall have each synthetic web sling marked or coded to show:

- (i) Name or trademark of manufacturer.
- (ii) Rated capacities for the type of hitch.
- (iii) Type of material.

(b) Rated capacity shall not be exceeded.

(6) Shackles and hooks.

(a) Table F-19 shall be used to determine the safe working loads of various sizes of shackles, except that higher safe working loads are permissible when recommended by the manufacturer for specific, identifiable products, provided that a safety factor of not less than 5 is maintained.

(b) The manufacturer's recommendations shall be followed in determining the safe working loads of the various sizes and types of specific and identifiable hooks. All hooks for which no applicable manufacturer's recommendations are available shall be tested to twice the intended safe working load before they are initially put into use. The employer shall maintain a record of the dates and results of such tests.



(c) Hooks shall not be modified by welding and/or drilling unless written approval by the manufacturer has been received.

(7) Slings.

(a) When slings are provided as a part of the hoisting equipment, every precaution shall be taken to keep them in a serviceable condition.

(i) Wire rope slings shall be frequently inspected and oiled.

(ii) Slings shall not be left where they can be damaged by traffic or form stumbling hazards.

(iii) Blocks or heavy bagging shall be used at corners of the load to protect the sling from sharp bending.

(b) When a load is lifted by a multiple rope sling the sling shall be so arranged that the strain can be equalized between the ropes.

(i) When using a sling with both ends engaged in the hoisting block, the sling shall be adjusted so as to equalize the stress.

(ii) Slings shall be placed on the load at safe lifting angles.

(8) Material handling—General.

(a) When necessary to store building material on public thoroughfares, care shall be exercised to see that it is so piled or stacked as to be safe against collapse or falling over.

(b) Material shall be so located as not to interfere with, or present a hazard to employees, traffic or the public.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-330, filed 1/21/86. Statutory Authority: RCW 49.17.040, 49.17.150, and 49.17.240. 79-08-115 (Order 79-9), § 296-155-330, filed 7/31/79; Order 76-29, § 296-155-330, filed 9/30/76; Order 74-26, § 296-155-330, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-335 Disposal of waste materials.** (1) Whenever materials are dropped more than 20 feet to any point lying outside the exterior walls of the building, an enclosed chute of wood, or equivalent material, shall be used. For the purpose of this subsection, an enclosed chute is a slide, closed in on all sides, through which material is moved from a high place to a lower one.

(2) When debris is dropped without the use of chutes, the area onto which the material is dropped shall be completely enclosed with barricades not less than 42 inches high and not less than 20 feet back from the projected edge of the opening above. Signs warning of the hazard of falling materials shall be posted at each level. Removal shall not be permitted in this lower area until debris handling ceases above.

(3) All scrap lumber, waste material, and rubbish shall be removed from the immediate work area as the work progresses.

(4) Disposal of waste material or debris by burning shall comply with local fire regulations.

(5) All solvent waste, oily rags, and flammable liquids shall be kept in fire resistant covered containers until removed from the worksite.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-335, filed 1/21/86; Order 74-26, § 296-155-335, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-34901 Table F-1.**

**TABLE F-1**

**RATED CAPACITY (WORKING LOAD LIMIT), FOR ALLOY STEEL CHAIN SLINGS\* RATED CAPACITY (WORKING LOAD LIMIT), POUNDS**

**TABLE F-1: PART 1—Double Slings**

Chain Size, Inches	Single Branch Sling – 90 degrees Loading	Double Sling Vertical Angle <sup>1</sup>		
		30 degree	45 degree	60 degree
		Horizontal Angle <sup>2</sup>		
		60 degree	45 degree	30 degree
1/4	3,250	5,560	4,550	3,250
3/8	6,600	11,400	9,300	6,600
1/2	11,250	19,500	15,900	11,250
5/8	16,500	28,500	23,300	16,500
3/4	23,000	39,800	32,500	23,000
7/8	28,750	49,800	40,600	28,750
1	38,750	67,100	54,800	38,750
1-1/8	44,500	77,000	63,000	44,500
1-1/4	57,500	99,500	81,000	57,500
1-3/8	67,000	116,000	94,000	67,000
1-1/2	80,000	138,000	112,500	80,000
1-3/4	100,000	172,000	140,000	100,000

**TABLE F-1: PART 2—Triple and Quadruple Slings**

Chain Size, Inches	Single Branch Sling – 90 degrees Loading	Triple and Quadruple Sling Vertical Angle <sup>(1)</sup>		
		30 degree	45 degree	60 degree
		Horizontal Angle <sup>(2)</sup>		
		60 degree	45 degree	30 degree
1/4	3,250	8,400	6,800	4,900
3/8	6,600	17,000	14,000	9,900
1/2	11,250	29,000	24,000	17,000
5/8	16,000	43,000	35,000	24,500
3/4	23,000	59,500	48,500	34,500
7/8	28,750	74,500	61,000	43,000
1	38,750	101,000	82,000	58,000
1-1/8	44,500	115,500	94,500	66,500
1-1/4	57,500	149,000	121,500	86,000
1-3/8	67,000	174,000	141,000	100,500
1-1/2	80,000	207,000	169,000	119,500
1-3/4	100,000	258,000	210,000	150,000

<sup>1</sup> Rating of multileg slings adjusted for angle of loading measured as the included angle between the inclined leg and the vertical.

<sup>2</sup> Rating of multileg slings adjusted for angle of loading between the inclined leg and the horizontal plane of the load.

\*Other grades of proof tested steel chain include proof coil, BBB coil and hi-test chain. These grades are not recommended for overhead lifting and therefore are not covered by this standard.

[Order 74-26, § 296-155-335 (part), Table F-1 (codified as WAC 296-155-34901), filed 5/7/74, effective 6/6/74.]

**WAC 296-155-34902 Table F-2.**

**TABLE F-2**

**MAXIMUM ALLOWABLE WEAR AT ANY POINT OF LINK**

Chain Size (inches)	Maximum Allowable Wear (inch)
1/4	3/64
3/8	5/64
1/2	7/64
5/8	9/64
3/4	5/32
7/8	11/64
1	3/16
1 1/8	7/32
1 1/4	1/4
1 3/8	9/32
1 1/2	5/16
1 3/4	11/32

[Order 74-26, § 296-155-335 (part), Table F-2 (codified as WAC 296-155-34902), filed 5/7/74, effective 6/6/74.]

**WAC 296-155-34903 Table F-3.**

**TABLE F-3**

**RATED CAPACITIES FOR SINGLE LEG SLINGS  
6 x 19 and 6 x 37 CLASSIFICATION  
IMPROVED PLOW STEEL GRADE ROPE  
WITH FIBER CORE (FC)**

Rope Dia. Constr. (Inches)	Rated Capacities, Tons (2,000 lb)								
	Vertical			Choker			Vertical Basket*		
	HT	MS	S	HT	MS	S	HT	MS	S
1/4 6x19	0.49	0.51	0.55	0.37	0.38	0.41	0.99	1.0	1.1
5/16 6x19	0.76	0.79	0.85	0.57	0.59	0.64	1.5	1.6	1.7
3/8 6x19	1.1	1.1	1.2	0.80	0.85	0.91	2.1	2.2	2.4
7/16 6x19	1.4	1.5	1.6	1.1	1.1	1.2	2.9	3.0	3.3
1/2 6x19	1.8	2.0	2.1	1.4	1.5	1.6	3.7	3.9	4.3
9/16 6x19	2.3	2.5	2.7	1.7	1.9	2.0	4.6	5.0	5.4
5/8 6x19	2.8	3.1	3.3	2.1	2.3	2.5	5.6	6.2	6.7
3/4 6x19	3.9	4.4	4.8	2.9	3.3	3.6	7.8	8.8	9.5
7/8 6x19	5.1	5.9	6.4	3.9	4.5	4.8	10.0	12.0	13.0
1 6x19	6.7	7.7	8.4	5.0	5.8	6.3	13.0	15.0	17.0
1-1/8 6x19	8.4	9.5	10.0	6.3	7.1	7.9	17.0	19.0	21.0
1-1/4 6x37	9.8	11.0	12.0	7.4	8.3	9.2	20.0	22.0	25.0
1-3/8 6x37	12.0	13.0	15.0	8.9	10.0	11.0	24.0	27.0	30.0
1-1/2 6x37	14.0	16.0	17.0	10.0	12.0	13.0	28.0	32.0	35.0
1-5/8 6x37	16.0	18.0	21.0	12.0	14.0	15.0	33.0	37.0	41.0
1-3/4 6x37	19.0	21.0	24.0	14.0	16.0	18.0	38.0	43.0	48.0
2 6x37	25.0	28.0	31.0	18.0	21.0	23.0	49.0	55.0	62.0

HT = Hand tucked splice and hidden tuck splice for hidden tuck splice (IWRC) use value in HT column.  
 MS = Mechanical splice.  
 S = Swaged or zinc poured socket.  
 \* These values only apply when the D/d ratio for HT slings is 10 or greater, and for MS and S slings is 20 or greater where:

D = Diameter of curvature around which the body of the sling is bent.  
 d = Diameter of rope.

[Order 74-26, § 296-155-335 (part), Table F-3 (codified as WAC 296-155-34903), filed 5/7/74, effective 6/6/74.]

**WAC 296-155-34904 Table F-4.**

**TABLE F-4**

**RATED CAPACITIES FOR SINGLE LEG SLINGS  
6 X 19 AND 6 X 37 CLASSIFICATION  
IMPROVED PLOW STEEL GRADE ROPE  
WITH INDEPENDENT WIRE ROPE CORE (IWRC)**

Rope Dia. Constr. (Inches)	Rated Capacities, Tons (2,000 lb)								
	Vertical			Choker			Vertical Basket*		
	HT	MS	S	HT	MS	S	HT	MS	S
1/4 6x19	0.53	0.56	0.59	0.40	0.42	0.44	1.0	1.1	1.2
5/16 6x19	0.81	0.87	0.92	0.61	0.65	0.69	1.6	1.7	1.8
3/8 6x19	1.1	1.2	1.3	0.86	0.93	0.98	2.3	2.5	2.6
7/16 6x19	1.5	1.7	1.8	1.2	1.3	1.3	3.1	3.4	3.5
1/2 6x19	2.0	2.2	2.3	1.5	1.6	1.7	3.9	4.4	4.6
9/16 6x19	2.5	2.7	2.9	1.8	2.1	2.2	4.9	5.5	5.8
5/8 6x19	3.0	3.4	3.6	2.2	2.5	2.7	6.0	6.8	7.2
3/4 6x19	4.2	4.9	5.1	3.1	3.6	3.8	8.4	9.7	10.0
7/8 6x19	5.5	6.6	6.9	4.1	4.9	5.2	11.0	13.0	14.0
1 6x19	7.2	8.5	9.0	5.4	6.4	6.7	14.0	17.0	18.0
1-1/8 6x19	9.0	10.0	11.0	6.8	7.8	8.5	18.0	21.0	23.0
1-1/4 6x37	10.0	12.0	13.0	7.9	9.2	9.9	21.0	24.0	26.0
1-3/8 6x37	13.0	15.0	16.0	9.6	11.0	12.0	25.0	29.0	32.0
1-1/2 6x37	15.0	17.0	19.0	11.0	13.0	14.0	30.0	35.0	38.0
1-5/8 6x37	18.0	20.0	22.0	13.0	15.0	17.0	35.0	41.0	44.0
1-3/4 6x37	20.0	24.0	26.0	15.0	18.0	19.0	41.0	47.0	51.0
2 6x37	26.0	30.0	33.0	20.0	23.0	25.0	53.0	61.0	66.0

HT = Hand tucked splice for hidden tuck splice (IWRC) use Table F3 values in HT column.  
 MS = Mechanical splice.  
 S = Swaged or zinc poured socket.  
 \* These values only apply when the D/d ratio for HT slings is 10 or greater, and for MS and S slings is 20 or greater where:  
 D = Diameter of curvature around which the body of the sling is bent.  
 d = Diameter of rope.

[Order 74-26, § 296-155-335 (part), Table F-4 (codified as WAC 296-155-34904), filed 5/7/74, effective 6/6/74.]

**WAC 296-155-34905 Table F-5.**

**TABLE F-5**

**RATED CAPACITIES FOR SINGLE LEG SLINGS  
CABLE LAND ROPE -  
MECHANICAL SPLICE ONLY  
7 x 7 x 7 & 7 x 7 x 19 CONSTRUCTIONS  
GALVANIZED AIRCRAFT GRADE ROPE  
7 x 6 x 19 IWRC CONSTRUCTION  
IMPROVED PLOW STEEL GRADE ROPE**

Rope Dia. (Inches)	Constr.	Rated Capacities, Tons (2,000 lb)		
		Vertical	Choker	Vertical Basket*
1/4	7x7x7	0.50	0.38	1.0
3/8	7x7x7	1.1	.81	2.2
1/2	7x7x7	1.8	1.4	3.7
5/8	7x7x7	2.8	2.1	5.5
3/4	7x7x7	3.8	2.9	7.6
5/8	7x7x19	2.9	2.2	5.8
3/4	7x7x19	4.1	3.0	8.1
7/8	7x7x19	5.4	4.0	11.0

TABLE F-5--cont.

Rope		Rated Capacities, Tons (2,000 lb)			
Dia. (Inches)	Constr.	Vertical	Choker	Vertical	Basket*
1	7x7x19	6.9	5.1		14.0
1-1/8	7x7x19	8.2	6.2		16.0
1-1/4	7x7x19	9.9	7.4		20.0
3/4	7x6x19 IWRC	3.8	2.8		7.6
7/8	7x6x19 IWRC	5.0	3.8		10.0
1	7x6x19 IWRC	6.4	4.8		13.0
1-1/8	7x6x19 IWRC	7.7	5.8		15.0
1-1/4	7x6x19 IWRC	9.2	6.9		18.0
1-5/16	7x6x19 IWRC	10.0	7.5		20.0
1-3/8	7x6x19 IWRC	11.0	8.2		22.0
1-1/2	7x6x19 IWRC	13.0	9.6		26.0

\* These values only apply when the D/d ratio is 10 or greater where:  
 D = Diameter of curvature around which the body of the sling is bent.  
 d = Diameter of rope.

[Order 74-26, § 296-155-335 (part), Table F-5 (codified as WAC 296-155-34905), filed 5/7/74, effective 6/6/74.]

WAC 296-155-34906 Table F-6.

TABLE F-6

RATED CAPACITIES FOR SINGLE LEG SLINGS  
 8-PART AND 6-PART BRAIDED ROPE  
 6 x 7 AND 6 x 19 CONSTRUCTION  
 IMPROVED PLOW STEEL GRADE ROPE  
 7 x 7 CONSTRUCTION GALVANIZED  
 AIRCRAFT GRADE ROPE

Component Ropes		Rated Capacities, Tons (2,000 lb)					
Diameter (inches)	Constr.	Vertical		Choker		Basket Vertical to 30 degrees*	
		8-Part	6-Part	8-Part	6-Part	8-Part	6-Part
3/32	6 x 7	0.42	0.32	0.32	0.24	0.74	0.55
1/8	6 x 7	0.76	0.57	0.57	0.42	1.3	0.98
3/16	6 x 7	1.7	1.3	1.3	0.94	2.9	2.2
3/32	7 x 7	0.51	0.39	0.38	0.29	0.89	0.67
1/8	7 x 7	0.95	0.71	0.71	0.53	1.6	1.2
3/16	7 x 7	2.1	1.5	1.5	1.2	3.6	2.7
3/16	6 x 19	1.7	1.3	1.3	0.98	3.0	2.2
1/4	6 x 19	3.1	2.3	2.3	1.7	5.3	4.0
5/16	6 x 19	4.8	3.6	3.6	2.7	8.3	6.2
3/8	6 x 19	6.8	5.1	5.1	3.8	12.0	8.9
7/16	6 x 19	9.3	6.9	6.9	5.2	16.0	12.0
1/2	6 x 19	12.0	9.0	9.0	6.7	21.0	15.0
9/16	6 x 19	15.0	11.0	11.0	8.5	26.0	20.0
5/8	6 x 19	19.0	14.0	14.0	10.0	32.0	24.0
3/4	6 x 19	27.0	20.0	20.0	15.0	46.0	35.0
7/8	6 x 19	36.0	27.0	27.0	20.0	62.0	47.0
1	6 x 19	47.0	35.0	35.0	26.0	81.0	61.0

\* These values only apply when the D/d ratio is 20 or greater where:  
 D = Diameter of curvature around which the body of the sling is bent.  
 d = Diameter of component rope.

[Order 74-26, § 296-155-335 (part), Table F-6 (codified as WAC 296-155-34906), filed 5/7/74, effective 6/6/74.]

WAC 296-155-34907 Table F-7.

TABLE F-7

RATED CAPACITIES FOR 2-LEG & 3-LEG BRIDLE SLINGS  
 6 x 19 AND 6 x 37 CLASSIFICATION  
 IMPROVED PLOW STEEL GRADE ROPE  
 WITH FIBER CORE (FC)

TABLE F-7: PART 1--2-Leg Bridle Slings

Rope		Rated Capacities, Tons (2,000 lb)					
Dia. (Inches)	Constr.	2-Leg Bridle Slings					
		Vert 30 degree		45 degree Angle		Vert 60 degree	
		Horz 60 degree		HT	MS	HT	MS
1/4	6 x 19	0.85	0.88	0.70	0.72	0.49	0.51
5/16	6 x 19	1.3	1.4	1.1	1.1	0.76	0.79
3/8	6 x 19	1.8	1.9	1.5	1.6	1.1	1.1
7/16	6 x 19	2.5	2.6	2.0	2.2	1.4	1.5
1/2	6 x 19	3.2	3.4	2.6	2.8	1.8	2.0
9/16	6 x 19	4.0	4.3	3.2	3.5	2.3	2.5
5/8	6 x 19	4.8	5.3	4.0	4.4	2.8	3.1
3/4	6 x 19	6.8	7.6	5.5	6.2	3.9	4.4
7/8	6 x 19	8.9	10.0	7.3	8.4	5.1	5.9
1	6 x 19	11.0	13.0	9.4	11.0	6.7	7.7
1-1/8	6 x 19	14.0	16.0	12.0	13.0	8.4	9.5
1-1/4	6 x 37	17.0	19.0	14.0	16.0	9.8	11.0
1-3/8	6 x 37	20.0	23.0	17.0	19.0	12.0	13.0
1-1/2	6 x 37	24.0	27.0	20.0	22.0	14.0	16.0
1-5/8	6 x 37	28.0	32.0	23.0	26.0	16.0	18.0
1-3/4	6 x 37	33.0	37.0	27.0	30.0	19.0	21.0
2	6 x 37	43.0	48.0	35.0	39.0	25.0	28.0

HT = Hand tucked splice.  
 MS = Mechanical splice.

TABLE F-7: PART 2--3-Leg Bridle Slings

Rope		Rated Capacities, Tons (2,000 lb)					
Dia. (Inches)	Constr.	3-Leg Bridle Slings					
		Vert 30 degree		45 degree Angle		Vert 60 degree	
		Horz 60 degree		HT	MS	HT	MS
1/4	6 x 19	1.3	1.3	1.0	1.1	0.74	0.7
5/16	6 x 19	2.0	2.0	1.6	1.7	1.1	1.2
3/8	6 x 19	2.8	2.9	2.3	2.4	1.6	1.7
7/16	6 x 19	3.7	4.0	3.0	3.2	2.1	2.3
1/2	6 x 19	4.8	5.1	3.9	4.2	2.8	3.0
9/16	6 x 19	6.0	6.5	4.9	5.3	3.4	3.7
5/8	6 x 19	7.3	8.0	5.9	6.5	4.2	4.6
3/4	6 x 19	10.0	11.0	8.3	9.3	5.8	6.6
7/8	6 x 19	13.0	15.0	11.0	13.0	7.7	8.9
1	6 x 19	17.0	20.0	14.0	16.0	10.0	11.0
1-1/8	6 x 19	22.0	24.0	18.0	20.0	13.0	14.0
1-1/4	6 x 37	25.0	29.0	21.0	23.0	15.0	17.0
1-3/8	6 x 37	31.0	35.0	25.0	28.0	18.0	20.0
1-1/2	6 x 37	36.0	41.0	30.0	33.0	21.0	24.0
1-5/8	6 x 37	43.0	48.0	35.0	39.0	25.0	28.0
1-3/4	6 x 37	49.0	56.0	40.0	45.0	28.0	32.0
2	6 x 37	64.0	72.0	52.0	59.0	37.0	41.0

HT = Hand tucked splice.  
 MS = Mechanical splice.

[Order 74-26, § 296-155-335 (part), Table F-7 (codified as WAC 296-155-34907), filed 5/7/74, effective 6/6/74.]

**WAC 296-155-34908 Table F-8.**

**TABLE F-8**

**RATED CAPACITIES FOR 2-LEG & 3-LEG BRIDLE SLINGS  
6 x 19 AND 6 x 37 CLASSIFICATION  
IMPROVED PLOW STEEL GRADE ROPE  
WITH INDEPENDENT WIRE  
ROPE CORE (IWRC)**

**TABLE F-8: PART 1--2-Leg Bridle Slings**

Rope		Rated Capacities, Tons (2,000 lb)					
Dia. (Inches)	Constr.	2-Leg Bridle Slings					
		Vert 30 degree		45 degree		Vert 60 degree	
		Horz 60 degree	Angle	Horz 30 degree	Angle	Horz 30 degree	Angle
		HT	MS	HT	MS	HT	MS
1/4	6 x 19	0.92	0.97	0.75	0.79	0.53	0.56
5/16	6 x 19	1.4	1.5	1.1	1.2	1.81	0.87
3/8	6 x 19	2.0	2.1	1.6	1.8	1.1	1.2
7/16	6 x 19	2.7	2.9	2.2	2.4	1.5	1.7
1/2	6 x 19	3.4	3.8	2.8	3.1	2.0	2.2
9/16	6 x 19	4.3	4.8	3.5	3.9	2.5	2.7
5/8	6 x 19	5.2	5.9	4.2	4.8	3.0	3.4
3/4	6 x 19	7.3	8.4	5.9	6.9	4.2	4.9
7/8	6 x 19	9.6	11.0	7.8	9.3	5.5	6.6
1	6 x 19	12.0	15.0	10.0	12.0	7.2	8.5
1-1/8	6 x 19	16.0	18.0	13.0	15.0	9.0	10.0
1-1/4	6 x 37	18.0	21.0	15.0	17.0	10.0	12.0
1-3/8	6 x 37	22.0	25.0	18.0	21.0	13.0	15.0
1-1/2	6 x 37	26.0	30.0	21.0	25.0	15.0	17.0
1-5/8	6 x 37	31.0	35.0	25.0	29.0	18.0	20.0
1-3/4	6 x 37	35.0	41.0	29.0	33.0	20.0	24.0
2	6 x 37	46.0	53.0	37.0	43.0	26.0	30.0

HT = Hand tucked splice.  
MS = Mechanical splice.

**TABLE F-8: PART 2--3-Leg Bridle Slings**

Rope		Rated Capacities, Tons (2,000 lb)					
Dia. (Inches)	Constr.	3-Leg Bridle Sling					
		Vert 30 degree		45 degree		Vert 60 degree	
		Horz 60 degree	Angle	Horz 30 degree	Angle	Horz 30 degree	Angle
		HT	MS	HT	MS	HT	MS
1/4	6 x 19	1.4	1.4	1.1	1.2	0.79	0.84
5/16	6 x 19	2.1	2.3	1.7	1.8	1.2	1.3
3/8	6 x 19	3.0	3.2	2.4	2.6	1.7	1.9
7/16	6 x 19	4.0	4.4	3.3	3.6	2.3	2.5
1/2	6 x 19	5.1	5.7	4.2	4.6	3.0	3.3
9/16	6 x 19	6.4	7.1	5.2	5.8	3.7	4.1
5/8	6 x 19	7.8	8.8	6.4	7.2	4.5	5.1
3/4	6 x 19	11.0	13.0	8.9	10.0	6.3	7.3
7/8	6 x 19	14.0	17.0	12.0	14.0	8.3	9.9
1	6 x 19	19.0	22.0	15.0	18.0	11.0	13.0
1-1/8	6 x 19	23.0	27.0	19.0	22.0	13.0	16.0
1-1/4	6 x 37	27.0	32.0	22.0	26.0	16.0	18.0
1-3/8	6 x 37	33.0	38.0	27.0	31.0	19.0	22.0
1-1/2	6 x 37	39.0	45.0	32.0	37.0	23.0	26.0

(1989 Ed.)

**TABLE F-8: PART 2--3-Leg Bridle Slings**

Rope		Rated Capacities, Tons (2,000 lb)					
Dia. (Inches)	Constr.	3-Leg Bridle Sling					
		Vert 30 degree		45 degree		Vert 60 degree	
		Horz 60 degree	Angle	Horz 30 degree	Angle	Horz 30 degree	Angle
		HT	MS	HT	MS	HT	MS
1-5/8	6 x 37	46.0	53.0	38.0	43.0	27.0	31.0
1-3/4	6 x 37	53.0	61.0	43.0	50.0	31.0	35.0
2	6 x 37	68.0	79.0	56.0	65.0	40.0	46.0

HT = Hand tucked splice  
MS = Mechanical splice

[Order 74-26, § 296-155-335 (part), Table F-8 (codified as WAC 296-155-34908), filed 5/7/74, effective 6/6/74.]

**WAC 296-155-34909 Table F-9.**

**TABLE F-9**

**RATED CAPACITIES FOR 2-LEG AND 3-LEG BRIDLE SLINGS  
CABLE LAID ROPE -  
MECHANICAL SPLICE ONLY  
7 x 7 x 7 AND 7 x 7 x 19 CONSTRUCTIONS  
GALVANIZED AIRCRAFT GRADE ROPE  
7 x 6 x 19 IWRC CONSTRUCTION IMPROVED  
PLOW STEEL GRADE ROPE**

**TABLE F-9: PART 1--2-Leg Bridle Slings**

Rope		Rated Capacities, Tons (2,000 lb)			
Dia. (Inches)	Constr.	2-Leg Bridle Sling			
		Vert 30 deg		45 degree	
		Horz 60 deg	Angle	Horz 30 deg	Angle
1/4	7 x 7 x 7	0.87	0.71	0.50	
3/8	7 x 7 x 7	1.9	1.5	1.1	
1/2	7 x 7 x 7	3.2	2.6	1.8	
5/8	7 x 7 x 7	4.8	3.9	2.8	
3/4	7 x 7 x 7	6.6	5.4	3.8	
5/8	7 x 7 x 19	5.0	4.1	2.9	
3/4	7 x 7 x 19	7.0	5.7	4.1	
7/8	7 x 7 x 19	9.3	7.6	5.4	
1	7 x 7 x 19	12.0	9.7	6.9	
1-1/8	7 x 7 x 19	14.0	12.0	8.2	
1-1/4	7 x 7 x 19	17.0	14.0	9.9	
3/4	7 x 6 x 19 IWRC	6.6	5.4	3.8	
7/8	7 x 6 x 19 IWRC	8.7	7.1	5.0	
1	7 x 6 x 19 IWRC	11.0	9.0	6.4	
1-1/8	7 x 6 x 19 IWRC	13.0	11.0	7.7	
1-1/4	7 x 6 x 19 IWRC	16.0	13.0	9.2	
1-5/16	7 x 6 x 19 IWRC	17.0	14.0	10.0	
1-3/8	7 x 6 x 19 IWRC	19.0	15.0	11.0	
1-1/2	7 x 6 x 19 IWRC	22.0	18.0	13.0	

**TABLE F-9: PART 2--3-Leg Bridle Slings**

Rope		Rated Capacities, Tons (2,000 lb)			
Dia. (Inches)	Constr.	3-Leg Bridle Sling			
		Vert 30 deg		45 degree	
		Horz 60 deg	Angle	Horz 30 deg	Angle
1/4	7 x 7 x 7	1.3	1.1	0.75	
3/8	7 x 7 x 7	2.8	2.3	1.6	
1/2	7 x 7 x 7	4.8	3.9	2.8	

[Title 296 WAC--p 1939]

TABLE F-9: PART 2--3-Leg Bridle Slings

Rope		Rated Capacities, Tons (2,000 lb)		
		3-Leg Bridle Sling		
Dia. (Inches)	Constr.	Vert 30 deg Horz 60 deg	45 degree Angle	Vert 60 deg Horz 30 deg
5/8	7 x 7 x 7	7.2	5.9	4.2
3/4	7 x 7 x 7	9.9	8.1	5.7
5/8	7 x 7 x 19	7.5	6.1	4.3
3/4	7 x 7 x 19	10.0	8.6	6.1
7/8	7 x 7 x 19	14.0	11.0	8.1
1	7 x 7 x 19	18.0	14.0	10.0
1-1/8	7 x 7 x 19	21.0	17.0	12.0
1-1/4	7 x 7 x 19	26.0	21.0	15.0
3/4	7 x 6 x 19 IWRC	9.9	8.0	5.7
7/8	7 x 6 x 19 IWRC	13.0	11.0	7.5
1	7 x 6 x 19 IWRC	17.0	13.0	9.6
1-1/8	7 x 6 x 19 IWRC	20.0	16.0	11.0
1-1/4	7 x 6 x 19 IWRC	24.0	20.0	14.0
1-5/16	7 x 6 x 19 IWRC	26.0	21.0	15.0
1-3/8	7 x 6 x 19 IWRC	28.0	23.0	16.0
1-1/2	7 x 6 x 19 IWRC	33.0	27.0	19.0

[Order 74-26, § 296-155-335 (part), Table F-9 (codified as WAC 296-155-34909), filed 5/7/74, effective 6/6/74.]

WAC 296-155-34910 Table F-10.

TABLE F-10

RATED CAPACITIES FOR 2-LEG AND 3-LEG BRIDLE SLINGS 8-PART AND 6-PART BRAIDED ROPE 6 x 7 AND 6 x 19 CONSTRUCTION IMPROVED PLOW STEEL GRADE ROPE 7 x 7 CONSTRUCTION GALVANIZED AIRCRAFT GRADE ROPE

TABLE F-10: PART 1--2-Leg Bridle Slings

Rope		Rated Capacities, Tons (2,000 lb)					
		2-Leg Bridle Slings					
Dia. (Inches)	Constr.	Vert 30 degree Horz 60 degree	45 degree Angle	Vert 60 degree Horz 30 degree	8-Part	6-Part	
3/32	6 x 7	0.74	0.55	0.60	0.45	0.42	0.32
1/8	6 x 7	1.3	0.98	1.1	0.80	0.76	0.57
3/16	6 x 7	2.9	2.2	2.4	1.8	1.7	1.3
3/32	7 x 7	0.89	0.67	0.72	0.55	0.51	0.39
1/8	7 x 7	1.6	1.2	1.3	1.0	0.95	0.71
3/16	7 x 7	3.6	2.7	2.9	2.2	2.1	1.5
3/16	6 x 19	3.0	2.2	2.4	1.8	1.7	1.3
1/4	6 x 19	5.3	4.0	4.3	3.2	3.1	2.3
5/16	6 x 19	8.3	6.2	6.7	5.0	4.8	3.6
3/8	6 x 19	12.0	8.9	9.7	7.2	6.8	5.1
7/16	6 x 19	16.0	12.0	13.0	9.8	9.3	6.9
1/2	6 x 19	21.0	15.0	17.0	13.0	12.0	9.0
9/16	6 x 19	26.0	20.0	21.0	16.0	15.0	11.0
5/8	6 x 19	32.0	24.0	26.0	20.0	19.0	14.0
3/4	6 x 19	46.0	35.0	38.0	28.0	27.0	20.0
7/8	6 x 19	62.0	47.0	51.0	38.0	36.0	27.0
1	6 x 19	81.0	61.0	66.0	50.0	47.0	35.0

TABLE F-10: PART 2--3-Leg Bridle Slings

Rope		Rated Capacities, Tons (2,000 lb)					
		3-Leg Bridle Slings					
Dia. (Inches)	Constr.	Vert 30 degree Horz 60 degree	45 degree Angle	Vert 60 degree Horz 30 degree	8-Part	6-Part	
3/32	6 x 7	1.1	0.83	0.90	0.68	0.64	0.48
1/8	6 x 7	2.0	1.5	1.6	1.2	1.1	0.85
3/16	6 x 7	4.4	3.3	3.6	2.7	2.5	1.9
3/32	7 x 7	1.3	1.0	1.1	0.82	0.77	0.58
1/8	7 x 7	2.5	1.8	2.0	1.5	1.4	1.1
3/16	7 x 7	5.4	4.0	4.4	3.3	3.1	2.3
3/16	6 x 19	4.5	3.4	3.7	2.8	2.6	1.9
1/4	6 x 19	8.0	6.0	6.5	4.9	4.6	3.4
5/16	6 x 19	12.0	9.3	10.0	7.6	7.1	5.4
3/8	6 x 19	18.0	13.0	14.0	11.0	10.0	7.7
7/16	6 x 19	24.0	18.0	20.0	15.0	14.0	10.0
1/2	6 x 19	31.0	23.0	25.0	19.0	18.0	13.0
9/16	6 x 19	39.0	29.0	32.0	24.0	23.0	17.0
5/8	6 x 19	48.0	36.0	40.0	30.0	28.0	21.0
3/4	6 x 19	69.0	52.0	56.0	42.0	40.0	30.0
7/8	6 x 19	94.0	70.0	76.0	57.0	54.0	40.0
1	6 x 19	122.0	91.0	99.0	74.0	70.0	53.0

[Order 74-26, § 296-155-335 (part), Table F-10 (codified as WAC 296-155-34910), filed 5/7/74, effective 6/6/74.]

WAC 296-155-34911 Table F-11.

TABLE F-11

RATED CAPACITIES FOR STRAND LAID GROMMET - HAND TUCKED IMPROVED PLOW STEEL GRADE ROPE

ROPE BODY		RATED CAPACITIES, TONS (2,000 lb)		
		Vertical Choker	Vertical Basket*	
Dia. (inches)	Constr.	Vertical Choker	Vertical Basket*	
1/4	7 x 19	0.85	0.64	1.7
5/16	7 x 19	1.3	1.0	2.6
3/8	7 x 19	1.9	1.4	3.8
7/16	7 x 19	2.6	1.9	5.2
1/2	7 x 19	3.3	2.5	6.7
9/16	7 x 19	4.2	3.1	8.4
5/8	7 x 19	5.2	3.9	10.00
3/4	7 x 19	7.4	5.6	15.0
7/8	7 x 19	10.0	7.5	20.0
1	7 x 19	13.0	9.7	26.0
1-1/8	7 x 19	16.0	12.0	32.0
1-1/4	7 x 37	18.0	14.0	37.0
1-3/8	7 x 37	22.0	16.0	44.0
1-1/2	7 x 37	26.0	19.0	52.0

\* These values only apply when the D/d ratio is 5 or greater where:  
D = Diameter of curvature around which rope is bent.  
d = Diameter of rope body.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-34911, filed 1/21/86; Order 74-26, § 296-

155-335 (part), Table F-11 (codified as WAC 296-155-34911), filed 5/7/74, effective 6/6/74.]

TABLE F-13--cont.

WAC 296-155-34912 Table F-12.

TABLE F-12

RATED CAPACITIES FOR CABLE LAID GROMMET  
- HAND TUCKED 7 x 6 x 7 AND 7 x 6 x 19  
CONSTRUCTIONS IMPROVED PLOW  
STEEL GRADE ROPE  
7 x 7 x 7 CONSTRUCTION GALVANIZED  
AIRCRAFT GRADE ROPE

CABLE BODY		RATED CAPACITIES, TONS (2,000 lb)		
Dia. (inches)	Constr.	Vertical	Choker	Vertical Basket*
3/8	7 x 6 x 7	1.3	0.95	2.5
9/16	7 x 6 x 7	2.8	2.1	5.6
5/8	7 x 6 x 7	3.8	2.8	7.6
3/8	7 x 7 x 7	1.6	1.2	3.2
9/16	7 x 7 x 7	3.5	2.6	6.9
5/8	7 x 7 x 7	4.5	3.4	9.0
5/8	7 x 6 x 19	3.9	3.0	7.9
3/4	7 x 6 x 19	5.1	3.8	10.0
15/16	7 x 6 x 19	7.9	5.9	16.0
1-1/8	7 x 6 x 19	11.0	8.4	22.0
1-5/16	7 x 6 x 19	15.0	11.0	30.0
1-1/2	7 x 6 x 19	19.0	14.0	39.0
1-11/16	7 x 6 x 19	24.0	18.0	49.0
1-7/8	7 x 6 x 19	30.0	22.0	60.0
2-1/4	7 x 6 x 19	42.0	31.0	84.0
2-5/8	7 x 6 x 19	56.0	42.0	112.0

\* These values only apply when the D/d ratio is 5 or greater where:

D = Diameter of curvature around which cable body is bent.  
d = Diameter of cable body.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-34912, filed 1/21/86; Order 74-26, § 296-155-335 (part), Table F-12 (codified as WAC 296-155-34912), filed 5/7/74, effective 6/6/74.]

WAC 296-155-34913 Table F-13.

TABLE F-13

RATED CAPACITIES FOR STRAND LAID  
ENDLESS SLINGS-MECHANICAL JOINT  
IMPROVED PLOW STEEL GRADE ROPE

ROPE BODY		RATED CAPACITIES, TONS (2,000 lb)		
Dia. (inches)	Constr.	Vertical	Choker	Vertical Basket*
1/4	6 x 19 IWRC	0.92	0.69	1.8
3/8	6 x 19 IWRC	2.0	1.5	4.1
1/2	6 x 19 IWRC	3.6	2.7	7.2
5/8	6 x 19 IWRC	5.6	4.2	11.0
3/4	6 x 19 IWRC	8.0	6.0	16.0

ROPE BODY		RATED CAPACITIES, TONS (2,000 lb)		
Dia. (inches)	Constr.	Vertical	Choker	Vertical Basket*
7/8	6 x 19 IWRC	11.0	8.1	21.0
1	6 x 19 IWRC	14.0	10.0	28.0
1-1/8	6 x 19 IWRC	18.0	13.0	35.0
1-1/4	6 x 37 IWRC	21.0	15.0	41.0
1-3/8	6 x 37 IWRC	25.0	19.0	50.0
1-1/2	6 x 37 IWRC	29.0	22.0	59.0

\* These values only apply when the D/d ratio is 5 or greater where:

D = Diameter of curvature around which rope is bent.  
d = Diameter of rope body.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-34913, filed 1/21/86; Order 74-26, § 296-155-335 (part), Table F-13 (codified as WAC 296-155-34913), filed 5/7/74, effective 6/6/74.]

WAC 296-155-34914 Table F-14.

TABLE F-14

RATED CAPACITIES FOR CABLE LAID  
ENDLESS SLINGS-MECHANICAL JOINT  
7 x 7 x 7 AND 7 x 7 x 19 CONSTRUCTIONS  
GALVANIZED AIRCRAFT GRADE ROPE  
7 x 6 x 19 IWRC CONSTRUCTION IMPROVED  
PLOW STEEL GRADE ROPE

CABLE BODY		RATED CAPACITIES, TONS (2,000 lb)		
Dia. (inches)	Constr.	Vertical	Choker	Vertical Basket *
1/4	7 x 7 x 7	0.83	0.62	1.6
3/8	7 x 7 x 7	1.8	1.3	3.5
1/2	7 x 7 x 7	3.0	2.3	6.1
5/8	7 x 7 x 7	4.5	3.4	9.1
3/4	7 x 7 x 7	6.3	4.7	12.0
5/8	7 x 7 x 19	4.7	3.5	9.5
3/4	7 x 7 x 19	6.7	5.0	13.0
7/8	7 x 7 x 19	8.9	6.6	18.0
1	7 x 7 x 19	11.0	8.5	22.0
1-1/8	7 x 7 x 19	14.0	10.0	28.0
1-1/4	7 x 7 x 19	17.0	12.0	33.0
3/4	7 x 6 x 19 IWRC	6.2	4.7	12.0
7/8	7 x 6 x 19 IWRC	8.3	6.2	16.0
1	7 x 6 x 19 IWRC	10.0	7.9	21.0
1-1/8	7 x 6 x 19 IWRC	13.0	9.7	26.0
1-1/4	7 x 6 x 19 IWRC	16.0	12.0	31.0
1-3/4	7 x 6 x 19 IWRC	18.0	14.0	37.0
1-1/2	7 x 6 x 19 IWRC	22.0	16.0	43.0

\* These values only apply when the D/d value is 5 or greater where:

D = Diameter of curvature around which cable body is bent.  
d = Diameter of cable body.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-34914, filed 1/21/86; Order 74-26, § 296-

155-335 (part), Table F-14 (codified as WAC 296-155-34914), filed 5/7/74, effective 6/6/74.]

WAC 296-155-34915 Table F-15.

TABLE F-15

MANILA ROPE SLINGS

TABLE F-15: PART 1--Eye and Eye Sling

RATED CAPACITY IN POUNDS (Safety Factor = 5)									
EYE AND EYE SLING									
ROPE Dia- meter	Nominal weight per 100 ft in Pounds	Minimum Break- ing Strength in Pounds	Ver- tical Hitch	Chok- er Hitch	BASKET HITCH				
					Angle of Rope to Horizontal				
Nomi- nal in Inches	100 ft in Pounds	Strength in Pounds	Ver- tical Hitch	Chok- er Hitch	0 deg	30 deg	45 deg	60 deg	
1/2	7.5	2,650	550	250	1,100	900	750	550	
9/16	10.4	3,450	700	350	1,400	1,200	1,000	700	
5/8	13.3	4,400	900	450	1,800	1,500	1,200	900	
3/4	16.7	5,400	1,100	550	2,200	1,900	1,500	1,100	
13/16	19.5	6,500	1,300	650	2,600	2,300	1,800	1,300	
7/8	22.5	7,700	1,500	750	3,100	2,700	2,200	1,500	
1	27.0	9,000	1,800	900	3,600	3,100	2,600	1,800	
1 1/16	31.3	10,500	2,100	1,100	4,200	3,600	3,000	2,100	
1 1/8	36.0	12,000	2,400	1,200	4,800	4,200	3,400	2,400	
1 1/4	41.7	13,500	2,700	1,400	5,400	4,700	3,800	2,700	
1 5/16	47.9	15,000	3,000	1,500	6,000	5,200	4,300	3,000	
1 1/2	59.9	18,500	3,700	1,850	7,400	6,400	5,200	3,700	
1 5/8	74.6	22,500	4,500	2,300	9,000	7,800	6,400	4,500	
1 3/4	89.3	26,500	5,300	2,700	10,500	9,200	7,500	5,300	
2	107.5	31,000	6,200	3,100	12,500	10,500	8,800	6,200	
2 1/3	125.0	36,000	7,200	3,600	14,500	12,500	10,000	7,200	
2 1/4	146.0	41,000	8,200	4,100	16,500	14,000	11,500	8,200	
2 1/2	166.7	46,500	9,300	4,700	18,500	16,000	13,000	9,300	
2 5/8	190.8	52,000	10,500	5,200	21,000	18,000	14,500	10,500	

TABLE F-15: PART 2--Endless Sling

RATED CAPACITY IN POUNDS (Safety Factor = 5)									
ENDLESS SLING									
ROPE Dia- meter	Nominal weight per 100 ft in Pounds	Minimum Break- ing Strength in Pounds	Ver- tical Hitch	Chok- er Hitch	BASKET HITCH				
					Angle of Rope to Horizontal				
Nomi- nal in Inches	100 ft in Pounds	Strength in Pounds	Ver- tical Hitch	Chok- er Hitch	0 deg	30 deg	45 deg	60 deg	
1/2	7.5	2,650	950	500	1,900	1,700	1,400	950	
9/16	10.4	3,450	1,200	600	2,500	2,200	1,800	1,200	
5/8	13.3	4,400	1,600	800	3,200	2,700	2,200	1,600	
3/4	16.7	5,400	2,000	950	3,900	3,400	2,800	2,000	
13/16	19.5	6,500	2,300	1,200	4,700	4,100	3,300	2,300	
7/8	22.5	7,700	2,800	1,400	5,600	4,800	3,900	2,800	
1	27.0	9,000	3,200	1,600	6,500	5,600	4,600	3,200	
1 1/16	31.3	10,500	3,800	1,900	7,600	6,600	5,400	3,800	

TABLE F-15: PART 2--Endless Sling

RATED CAPACITY IN POUNDS (Safety Factor = 5)									
ENDLESS SLING									
ROPE Dia- meter	Nominal weight per 100 ft in Pounds	Minimum Break- ing Strength in Pounds	Ver- tical Hitch	Chok- er Hitch	BASKET HITCH				
					Angle of Rope to Horizontal				
Nomi- nal in Inches	100 ft in Pounds	Strength in Pounds	Ver- tical Hitch	Chok- er Hitch	0 deg	30 deg	45 deg	60 deg	
1 1/8	36.0	12,000	4,300	2,200	8,600	7,500	6,100	4,300	
1 1/4	41.7	13,500	4,900	2,400	9,700	8,400	6,900	4,900	
1 5/16	47.9	15,000	5,400	2,700	11,000	9,400	7,700	5,400	
1 1/2	59.9	18,500	6,700	3,300	13,500	11,500	9,400	6,700	
1 5/8	74.6	22,500	8,100	4,100	16,000	14,000	11,500	8,000	
1 3/4	89.3	26,500	9,500	4,800	19,000	16,500	13,500	9,500	
2	107.5	31,000	11,000	5,600	22,500	19,500	16,000	11,000	
2 1/3	125.0	36,000	13,000	6,500	26,000	22,500	18,500	13,000	
2 1/4	146.0	41,000	15,000	7,400	29,500	25,500	21,000	15,000	
2 1/2	166.7	46,500	16,500	8,400	33,500	29,000	23,500	16,500	
2 5/8	190.8	52,000	18,500	9,500	37,500	32,500	26,500	18,500	

[Order 74-26, § 296-155-335 (part), Table F-15 (codified as WAC 296-155-34915), filed 5/7/74, effective 6/6/74.]

WAC 296-155-34916 Table F-16.

TABLE F-16

NYLON ROPE SLINGS

TABLE F-16: PART 1--Eye and Eye Sling

RATED CAPACITY IN POUNDS (Safety Factor = 9)									
EYE AND EYE SLING									
ROPE Dia- meter	Nominal weight per 100 ft in Pounds	Minimum Break- ing Strength in Pounds	Ver- tical Hitch	Chok- er Hitch	BASKET HITCH				
					Angle of Rope to Horizontal				
Nomi- nal in Inches	100 ft in Pounds	Strength in Pounds	Ver- tical Hitch	Chok- er Hitch	0 deg	30 deg	45 deg	60 deg	
1/2	6.5	6,080	700	350	1,400	1,200	950	700	
9/16	8.3	7,600	850	400	1,700	1,500	1,200	850	
5/8	10.5	9,880	1,100	550	2,200	1,900	1,600	1,100	
3/4	14.5	13,490	1,500	750	3,000	2,600	2,100	1,500	
1 3/16	17.0	16,150	1,800	900	3,600	3,100	2,600	1,800	
7/8	20.0	19,000	2,100	1,100	4,200	3,700	3,000	2,100	
1	26.0	23,750	2,600	1,300	5,300	4,600	3,700	2,600	
1 1/16	29.0	27,360	3,000	1,500	6,100	5,300	4,300	3,000	
1 1/8	34.0	31,350	3,500	1,700	7,000	6,000	5,000	3,500	
1 1/4	40.0	35,625	4,000	2,000	7,900	6,900	5,600	4,000	
1 5/16	45.0	40,850	4,500	2,300	9,100	7,900	6,400	4,500	
1 1/2	55.0	50,350	5,600	2,800	11,000	9,700	7,900	5,600	
1 5/8	68.0	61,750	6,900	3,400	13,500	12,000	9,700	6,900	
1 3/4	83.0	74,100	8,200	4,100	16,500	14,500	11,500	8,200	
2	95.0	87,400	9,700	4,900	19,500	17,000	13,500	9,700	
2 1/8	109.0	100,700	11,000	5,600	22,500	19,500	16,000	11,000	
2 1/4	129.0	118,750	13,000	6,600	26,500	23,000	18,500	13,000	
2 1/2	149.0	133,000	15,000	7,400	29,500	25,500	21,000	15,000	
2 5/8	168.0	153,900	17,100	8,600	34,000	29,500	24,000	17,000	



TABLE F-16: PART 2--Endless Sling

RATED CAPACITY IN POUNDS (Safety Factor = 9)									
ENDLESS SLING									
BASKET HITCH									
ROPE Dia- meter	Nominal weight per 100 ft in Pounds	Minimum Break- ing Strength in Pounds	Ver- tical Hitch	Chok- er Hitch	Angle of Rope to Horizontal				
					90 deg	60 deg	45 deg	30 deg	
Nomi- nal in Inches					Angle of Rope to Vertical				
					0 deg	30 deg	45 deg	60 deg	
1/2	6.5	6,080	1,200	600	2,400	2,100	1,700	1,200	
9/16	8.3	7,600	1,500	750	3,000	2,600	2,200	1,500	
5/8	10.5	9,880	2,000	1,000	4,000	3,400	2,800	2,000	
3/4	14.5	13,490	2,700	1,400	5,400	4,700	3,800	2,700	
1 3/16	17.0	16,150	3,200	1,600	6,400	5,600	4,600	3,200	
7/8	20.0	19,000	3,800	1,900	7,600	6,600	5,400	3,800	
1	26.0	23,750	4,800	2,400	9,500	8,200	6,700	4,800	
1 1/16	29.0	27,360	5,500	2,700	11,000	9,500	7,700	5,500	
1 1/8	34.0	31,350	6,300	3,100	12,500	11,000	8,900	6,300	
1 1/4	40.0	35,625	7,100	3,600	14,500	12,500	10,000	7,100	
1 5/16	45.0	40,850	8,200	4,100	16,500	14,000	12,000	8,200	
1 1/2	55.0	50,350	10,000	5,000	20,000	17,500	14,000	10,000	
1 5/8	68.0	61,750	12,500	6,200	24,500	21,500	17,500	12,500	
1 3/4	83.0	74,100	15,000	7,400	29,500	27,500	21,000	15,000	
2	95.0	87,400	17,500	8,700	35,000	30,500	24,500	17,500	
2 1/8	109.0	100,700	20,000	10,000	40,500	35,000	28,500	20,000	
2 1/4	129.0	118,750	24,000	12,000	47,500	41,000	33,500	24,000	
2 1/2	149.0	133,000	26,500	13,500	53,000	46,000	37,500	26,500	
2 5/8	168.0	153,900	31,000	15,500	61,500	53,500	43,500	31,000	

[Order 74-26, § 296-155-335 (part), Table F-16 (codified as WAC 296-155-34916), filed 5/7/74, effective 6/6/74.]

WAC 296-155-34917 Table F-17.

TABLE F-17

POLYESTER ROPE SLINGS

TABLE F-17: PART 1--Eye and Eye Sling

RATED CAPACITY IN POUNDS (Safety Factor = 9)									
EYE AND EYE SLING									
BASKET HITCH									
ROPE Dia- meter	Nominal weight per 100 ft in Pounds	Minimum Break- ing Strength in Pounds	Ver- tical Hitch	Chok- er Hitch	Angle of Rope to Horizontal				
					90 deg	60 deg	45 deg	30 deg	
Nomi- nal in Inches					Angle of Rope to Vertical				
					0 deg	30 deg	45 deg	60 deg	
1/2	8.0	6,080	700	350	1,400	1,200	950	700	
9/16	10.2	7,600	850	400	1,700	1,500	1,200	850	
5/8	13.0	9,500	1,100	550	2,100	1,800	1,500	1,100	
3/4	17.5	11,875	1,300	650	2,600	2,300	1,900	1,300	
1 3/16	21.0	14,725	1,600	800	3,300	2,800	2,300	1,600	
7/8	25.0	17,100	1,900	950	3,800	3,300	2,700	1,900	
1	30.5	20,900	2,300	1,200	4,600	4,000	3,300	2,300	
1 1/16	34.5	24,225	2,700	1,300	5,400	4,700	3,800	2,700	

(1989 Ed.)

TABLE F-17: PART 1--Eye and Eye Sling

RATED CAPACITY IN POUNDS (Safety Factor = 9)									
EYE AND EYE SLING									
BASKET HITCH									
ROPE Dia- meter	Nominal weight per 100 ft in Pounds	Minimum Break- ing Strength in Pounds	Ver- tical Hitch	Chok- er Hitch	Angle of Rope to Horizontal				
					90 deg	60 deg	45 deg	30 deg	
Nomi- nal in Inches					Angle of Rope to Vertical				
					0 deg	30 deg	45 deg	60 deg	
1 1/8	40.0	28,025	3,100	1,600	6,200	5,400	4,400	3,100	
1 1/4	46.3	31,540	3,500	1,800	7,000	6,100	5,000	3,500	
1 5/16	52.5	35,625	4,000	2,000	7,900	6,900	5,600	4,000	
1 1/2	66.8	44,460	4,900	2,500	9,900	8,600	7,000	4,900	
1 5/8	82.0	54,150	6,000	3,000	12,000	10,400	8,500	6,000	
1 3/4	98.0	64,410	7,200	3,600	14,500	12,500	10,000	7,200	
2	118.0	76,000	8,400	4,200	17,000	14,500	12,000	8,400	
2 1/8	135.0	87,400	9,700	4,900	19,500	17,000	13,500	9,700	
2 1/4	157.0	101,650	11,500	5,700	22,500	19,500	16,000	11,500	
2 1/2	181.0	115,900	13,000	6,400	26,000	22,500	18,000	13,000	
2 5/8	205.0	130,150	14,500	7,200	29,000	25,000	20,500	14,500	

TABLE F-17: PART 2--Endless Sling

RATED CAPACITY IN POUNDS (Safety Factor = 9)									
ENDLESS SLING									
BASKET HITCH									
ROPE Dia- meter	Nominal weight per 100 ft in Pounds	Minimum Break- ing Strength in Pounds	Ver- tical Hitch	Chok- er Hitch	Angle of Rope to Horizontal				
					90 deg	60 deg	45 deg	30 deg	
Nomi- nal in Inches					Angle of Rope to Vertical				
					0 deg	30 deg	45 deg	60 deg	
1/2	8.0	6,080	1,200	600	2,400	2,100	1,700	1,200	
9/16	10.2	7,600	1,500	750	3,000	2,600	2,200	1,500	
5/8	13.0	9,500	1,900	950	3,800	3,300	2,700	1,900	
3/4	17.5	11,875	2,400	1,200	4,800	4,100	3,400	2,400	
1 3/16	21.0	14,725	2,900	1,500	5,900	5,100	4,200	2,900	
7/8	25.0	17,100	3,400	1,700	6,800	5,900	4,800	3,400	
1	30.5	20,900	4,200	2,100	8,400	7,200	5,900	4,200	
1 1/16	34.5	24,225	4,800	2,400	9,700	8,400	6,900	4,800	
1 1/8	40.0	28,025	5,600	2,800	11,000	9,700	7,900	5,600	
1 1/4	46.3	31,540	6,300	3,200	12,500	11,000	8,900	6,300	
1 5/16	52.5	35,625	7,100	3,600	14,500	12,500	10,000	7,100	
1 1/2	66.8	44,460	8,900	4,400	18,000	15,500	12,500	8,900	
1 5/8	82.0	54,150	11,000	5,400	21,500	19,000	15,500	11,000	
1 3/4	98.0	64,410	13,000	6,400	26,000	22,500	18,000	13,000	
2	118.0	76,000	15,000	7,600	30,500	26,500	21,500	15,000	
2 1/8	135.0	87,400	17,500	8,700	35,000	30,500	24,500	17,500	
2 1/4	157.0	101,650	20,500	10,000	40,500	35,000	29,000	20,500	
2 1/2	181.0	115,900	23,000	11,500	46,500	40,000	33,000	23,000	
2 5/8	205.0	130,150	26,000	13,000	52,000	45,000	37,000	26,000	

[Order 74-26, § 296-155-335 (part), Table F-17 (codified as WAC 296-155-34917), filed 5/7/74, effective 6/6/74.]

WAC 296-155-34918 Table F-18.

TABLE F-18  
PLOYPROPYLENE ROPE SLINGS  
TABLE F-18: PART 1--Eye and Eye Sling

RATED CAPACITY IN POUNDS (Safety Factor = 6)									
EYE AND EYE SLING									
ROPE Dia-meter Nominal in Inches	Nominal weight per 100 ft in Pounds	Minimum Break-ing Strength in Pounds	Ver-tical Hitch	Chok-er Hitch	BASKET HITCH				
					Angle of Rope to Horizontal				
					90 deg	60 deg	45 deg	30 deg	
1/2	4.7	3,990	650	350	1,300	1,200	950	65	
9/16	6.1	4,845	800	400	1,600	1,400	1,100	800	
5/8	7.5	5,890	1,000	500	2,000	1,700	1,400	1,000	
3/4	10.7	8,075	1,300	700	2,700	2,300	1,900	1,300	
13/16	12.7	9,405	1,600	800	3,100	2,700	2,200	1,600	
7/8	15.0	10,925	1,800	900	3,600	3,200	2,600	1,800	
1	18.0	13,300	2,200	1,100	4,400	3,800	3,100	2,200	
1 1/16	20.4	15,200	2,500	1,300	5,100	4,400	3,600	2,500	
1 1/8	23.7	17,385	2,900	1,500	5,800	5,000	4,100	2,900	
1 1/4	27.0	19,950	3,300	1,700	6,700	5,800	4,700	3,300	
1 5/16	30.5	22,325	3,700	1,900	7,400	6,400	5,300	3,700	
1 1/2	38.5	28,215	4,700	2,400	9,400	8,100	6,700	4,700	
1 5/8	47.5	34,200	5,700	2,900	11,500	9,900	8,100	5,700	
1 3/4	57.0	40,850	6,800	3,400	13,500	12,000	9,600	6,800	
2	69.0	49,400	8,200	4,100	16,500	14,500	11,500	8,200	
2 1/8	80.0	57,950	9,700	4,800	19,500	16,500	13,500	9,700	
2 1/4	92.0	65,550	11,000	5,500	22,000	19,000	15,500	11,000	
2 1/2	107.0	76,000	12,500	6,300	25,500	22,000	18,000	12,500	
2 5/8	120.0	85,500	14,500	7,100	28,500	24,500	20,000	14,500	

TABLE F-18: PART 2--Endless Sling

RATED CAPACITY IN POUNDS (Safety Factor = 6)									
ENDLESS SLING									
ROPE Dia-meter Nominal in Inches	Nominal weight per 100 ft in Pounds	Minimum Break-ing Strength in Pounds	Ver-tical Hitch	Chok-er Hitch	BASKET HITCH				
					Angle of Rope to Horizontal				
					90 deg	60 deg	45 deg	30 deg	
1/2	4.7	3,990	1,200	600	2,400	2,100	1,700	1,200	
9/16	6.1	4,845	1,500	750	2,900	2,500	2,100	1,500	
5/8	7.5	5,890	1,800	900	3,500	3,100	2,500	1,800	
3/4	10.7	8,075	2,400	1,200	4,900	4,200	3,400	2,400	
1 3/16	12.7	9,405	2,800	1,400	5,600	4,900	4,000	2,800	
7/8	15.0	10,925	3,300	1,600	6,600	5,700	4,600	3,300	
1	18.0	13,300	4,000	2,000	8,000	6,900	5,600	4,000	
1 1/16	20.4	15,200	4,600	2,300	9,100	7,900	6,500	4,600	
1 1/8	23.7	17,385	5,200	2,600	10,500	9,000	7,400	5,200	
1 1/4	27.0	19,950	6,000	3,000	12,000	10,500	8,500	6,000	
1 5/16	30.5	22,325	6,700	3,400	13,500	11,500	9,500	6,700	
1 1/2	38.5	28,215	8,500	4,200	17,000	14,500	12,000	8,500	
1 5/8	47.5	34,200	10,500	5,100	20,500	18,000	14,500	10,500	
1 3/4	57.0	40,850	12,500	6,100	24,500	21,000	17,500	12,500	
2	69.0	49,400	15,000	7,400	29,500	25,500	21,000	15,000	
2 1/8	80.0	57,950	17,500	8,700	35,000	30,100	24,500	17,500	

TABLE F-18: PART 2--Endless Sling

RATED CAPACITY IN POUNDS (Safety Factor = 6)									
ENDLESS SLING									
ROPE Dia-meter Nominal in Inches	Nominal weight per 100 ft in Pounds	Minimum Break-ing Strength in Pounds	Ver-tical Hitch	Chok-er Hitch	BASKET HITCH				
					Angle of Rope to Horizontal				
					90 deg	60 deg	45 deg	30 deg	
2 1/4	92.0	65,550	19,500	9,900	39,500	34,000	28,000	19,500	
2 1/2	107.0	76,000	23,000	11,500	45,500	39,500	32,500	23,000	
2 5/8	120.0	85,500	25,500	13,000	51,500	44,500	36,500	25,500	

[Order 74-26, § 296-155-335 (part), Table F-18 (codified as WAC 296-155-34918), filed 5/7/74, effective 6/6/74.]

WAC 296-155-34919 Table F-19.

TABLE F-19  
SAFE WORKING LOADS FOR SHACKLES  
(In tons of 2,000 pounds)

Material size (inches)	Pin diameter (inches)	Safe working load
1/2	5/8	1.4
5/8	3/4	2.2
3/4	7/8	3.2
7/8	1	4.3
1	1 1/8	5.6
1 1/8	1 1/4	6.7
1 1/4	1 3/8	8.2
1 3/8	1 1/2	10.0
1 1/2	1 5/8	11.9
1 3/4	2	16.2
2	2 1/4	21.2

[Order 74-26, § 296-155-335 (part), Table F-19 (codified as WAC 296-155-34919), filed 5/7/74, effective 6/6/74.]

WAC 296-155-34920 Table F-20.

TABLE F-20  
NUMBER AND SPACING OF U-BOLT  
WIRE ROPE CLIPS

Improved plow steel	Number of Clips	Minimum spacing (inches)
	Drop forged	
3/8 and under	4	3
1/2	3	3
5/8	3	3
3/4	4	4 1/2
7/8	4	5 1/4
1	5	6
1 1/8	6	7

TABLE F-20---cont.

Improved plow steel	Number of Clips		Minimum spacing (inches)
	Drop forged		
1 1/4	6		8
1 3/8	7		9
1 1/2	7		10

[Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-34920, filed 1/21/86; Order 74-26, § 296-155-335 (part), Table F-20 (codified as WAC 296-155-34920), filed 5/7/74, effective 6/6/74.]

### Part G TOOLS--HAND AND POWER

#### WAC

- 296-155-350 General requirements.
- 296-155-355 Hand tools.
- 296-155-360 Power-operated hand tools.
- 296-155-363 Safety requirements for powder actuated fastening systems, in accordance with ANSI A10.3-1977, Safety Requirements for Powder Actuated Fastening Systems.
- 296-155-36301 Scope.
- 296-155-36303 Purpose.
- 296-155-36305 Definitions applicable to this section.
- 296-155-36307 Requirements.
- 296-155-36309 Power loads.
- 296-155-36311 Fasteners.
- 296-155-36313 Operation.
- 296-155-36315 Limitations of use.
- 296-155-36317 Maintenance and storage.
- 296-155-36319 Authorized instructor.
- 296-155-36321 Qualified operator.
- 296-155-365 Abrasive wheels and tools.
- 296-155-367 Masonry saws.
- 296-155-370 Woodworking tools.
- 296-155-375 Jacks—Lever and ratchet, screw, and hydraulic.

**WAC 296-155-350 General requirements.** (1) Condition of tools. All hand and power tools and similar equipment, whether furnished by the employer or the employee, shall be maintained in a safe condition.

(2) Guarding.

(a) When power operated tools are designed to accommodate guards, they shall be equipped with such guards when in use.

(b) Belts, gears, shafts, pulleys, sprockets, spindles, drums, fly wheels, chains, or other reciprocating, rotating or moving parts of equipment shall be guarded if such parts are exposed to contact by employees or otherwise create a hazard. Guarding shall meet the requirements as set forth in American National Standards Institute, B15.1-1953 (R1958), Safety Code for Mechanical Power-Transmission Apparatus.

(3) Personal protective equipment. Employees using hand and power tools and exposed to the hazard of falling, flying, abrasive, and splashing objects, or exposed to harmful dusts, fumes, mists, vapors, or gases shall use the particular personal protective equipment necessary to protect them from the hazard. All personal protective

equipment shall meet the requirements and be maintained according to Parts B and C of this chapter.

(4) Switches.

(a) Scope. This subsection does not apply to concrete vibrators, concrete breakers, powered tampers, jack hammers, rock drills, and similar hand operated power tools.

(b) All hand-held powered platen sanders, grinders with wheels 2-inch diameter or less, routers, planers, laminate trimmers, nibblers, shears, scroll saws, and jigsaws with blade shanks one-fourth of an inch wide or less may be equipped with only a positive "on-off" control.

(c) All hand-held powered drills, tappers, fastener drivers, horizontal, vertical, and angle grinders with wheels greater than 2 inches in diameter, disc sanders, belt sanders, reciprocating saws, saber saws, and other similar operating powered tools shall be equipped with a momentary contact "on-off" control and may have a lock-on control provided that turn-off can be accomplished by a single motion of the same finger or fingers that turn it on.

(d) All other hand-held powered tools, such as circular saws, chain saws, and percussion tools, shall be equipped with a constant pressure switch that will shut off the power when the pressure is released.

(e) Disconnect switches. All fixed power driven tools shall be provided with a disconnect switch that can either be locked or tagged in the off position.

(f) Self-feed. Automatic feeding devices shall be installed on machines whenever the nature of the work will permit. Feeder attachments shall have the feed rolls or other moving parts covered or guarded so as to protect the operator from hazardous points.

[Order 74-26, § 296-155-350, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-355 Hand tools.** (1) Employers shall not issue or permit the use of unsafe hand tools.

(2) Wrenches, including adjustable, pipe, end, and socket wrenches shall not be used when jaws are sprung or worn to the point that slippage occurs.

(3) Nails shall not be cut with an axe.

(4) Impact tools, such as drift pins, wedges, and chisels, shall be kept free of mushroomed heads.

(5) The wooden handles of tools shall be kept free of splinters or cracks and shall be kept tight in the tool.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-355, filed 1/21/86; Order 74-26, § 296-155-355, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-360 Power-operated hand tools.** (1) Electric Power-operated tools.

(a) Electric power operated tools shall either be of the approved double-insulated type or grounded in accordance with Part I of this chapter.

(b) The use of electric cords for hoisting or lowering tools shall not be permitted.

(2) Pneumatic power tools.

(a) Pneumatic power tools and hose sections shall be secured by threaded couplings, quick disconnect couplings or by 100 pound tensile strength safety chain or

equivalent across each connection to prevent the tool or hose connections from becoming accidentally disconnected.

(b) Safety clips or retainers shall be securely installed and maintained on pneumatic impact (percussion) tools to prevent attachments from being accidentally expelled.

(c) All pneumatically driven nailers, staplers, and other similar equipment provided with automatic fastener feed, shall have a safety device on the muzzle to prevent the tool from ejecting fasteners, unless the muzzle is in contact with the work surface.

**EXCEPTION:** Pneumatic nailers or staplers utilizing "fine wire" brads or staples do not require a muzzle contact safety device, provided:

(1) The overall weight of the fastening device does not exceed the weight of standard 18 gauge wire, 1-1/2 inches long.

(2) The operator and any other person within 12 feet of the point of operation wear approved eye protection.

**Note:** The normal maximum diameter tolerance for manufacturing standard 18 gauge wire is .045 inches.

(d) Compressed air shall not be used at the nozzle for cleaning purposes except where reduced to less than 30 p.s.i. and then only with effective chip guarding and personal protective equipment which meets the requirements of Part C of this chapter.

**Note:** The above requirement does not apply to concrete form, mill scale and similar cleaning purposes. Concrete form, mill scale, and similar cleaning may be performed with air pressure exceeding 30 p.s.i. provided the nozzle and/or cleaning pipe is at least three feet long with a quick-closing (deadman) valve between the hose and the nozzle or pipe. The operator and all other employees within range of flying debris shall be protected by eye or face protection as specified in WAC 296-155-215.

(e) The manufacturer's safe operating pressure for hoses, pipes, valves, filters, and other fittings shall not be exceeded.

(f) The use of hoses for hoisting or lowering tools shall not be permitted.

(g) All hoses exceeding 1/2-inch inside diameter shall have a safety device at the source of supply or branch line to reduce pressure in case of hose failure.

(h) Airless spray guns of the type which atomize paints and fluids at high pressures (1,000 pounds or more per square inch) shall be equipped with automatic or visible manual safety devices which will prevent pulling of the trigger to prevent release of the paint or fluid until the safety device is manually released.

(i) In lieu of the above, a diffuser nut which will prevent high pressure, high velocity release, while the nozzle tip is removed, plus a nozzle tip guard which will prevent the tip from coming into contact with the operator, or other equivalent protection, shall be provided.

(3) Fuel powered tools.

(a) All fuel powered tools shall be stopped while being refueled, serviced, or maintained, and fuel shall be transported, handled, and stored in accordance with Part D of this chapter.

(b) When fuel powered tools are used in enclosed spaces, the applicable requirements for concentrations of

toxic gases and use of personal protective equipment as outlined in Parts B and C of this chapter shall apply.

(4) Hydraulic power tools.

(a) The fluid used in hydraulic powered tools shall be fire resistant fluid approved under schedule 30 of the Bureau of Mines, U.S. Department of the Interior, and shall retain its operating characteristics at the most extreme temperatures to which it will be exposed.

(b) The manufacturer's safe operating pressures for hoses, valves, pipes, filters, and other fittings shall not be exceeded.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-360, filed 1/21/86; Order 76-29, § 296-155-360, filed 9/30/76; Order 76-6, § 296-155-360, filed 3/1/76; Order 74-26, § 296-155-360, filed 5/7/74, effective 6/6/74.]

#### **WAC 296-155-363 Safety requirements for powder actuated fastening systems, in accordance with ANSI A10.3-1977, Safety Requirements for Powder Actuated Fastening Systems.**

[Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-363, filed 1/21/86.]

**WAC 296-155-36301 Scope.** This standard provides safety requirements for a powder actuated fastening tool or machine which propels a stud, pin, fastener, or other object for the purpose of affixing it by penetration to another object.

This standard does not apply to devices designed for attaching objects to soft construction materials, such as wood, plaster, tar, dry wallboard, and the like, or to stud welding equipment.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-36301, filed 1/21/86.]

**WAC 296-155-36303 Purpose.** The purpose of this standard is to provide reasonable safety for life, limb, and property, by establishing requirements for design, construction, operation, service, and storage of powder actuated fastening tools, fasteners and power loads.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-36303, filed 1/21/86.]

**WAC 296-155-36305 Definitions applicable to this section.** (1) Angle control – a safety feature designed to prevent a tool from operating when tilted beyond a predetermined angle.

(2) Approved – meeting the requirements of this standard and acceptable to the department of labor and industries, division of industrial safety and health.

(3) Cased power load – a power load with the propellant contained in a closed case.

(4) Caseless power load – a power load with the propellant in solid form not requiring containment.

(5) Chamber (noun) – the location in the tool into which the power load is placed and in which it is actuated.

(6) Chamber (verb) – to fit the chamber according to manufacturer's specifications.

(7) Fasteners – any pins (unthreaded heads) or studs (threaded heads) driven by powder actuated tools.

(8) Fixture – a special shield that provides equivalent protection where the standard shield cannot be used.

(9) Head – that portion of a fastener that extends above the work surface after being properly driven.

(10) Misfire – a condition in which the power load fails to ignite after the tool has been operated.

(11) Powder actuated fastening system – a method comprising the use of a powder actuated tool, a power load, and a fastener.

(12) Powder actuated tool (also known as tool) – a tool that utilizes the expanding gases from a power load to drive a fastener.

(13) Power load – the energy source used in powder actuated tools.

(14) Qualified operator – a person who meets the requirements of WAC 296-155-36321 (1) and (2).

(15) Shield – a device, attached to the muzzle end of a tool, which is designed to confine flying particles.

(16) Spalled area – a damaged and nonuniform concrete or masonry surface.

(17) Test velocity – the measurement of fastener velocity performed in accordance with WAC 296-155-36307 (1)(m).

(18) Tools – tools can be divided into two types: Direct acting and indirect acting; and three classes: Low velocity, medium velocity, and high velocity.

(a) Direct acting tool – a tool in which the expanding gas of the power load acts directly on the fastener to be driven.

(b) Indirect acting tool – a tool in which the expanding gas of the power load acts on a captive piston, which in turn drives the fastener.

(c) Low-velocity tool – a tool whose test velocity has been measured ten times while utilizing the highest velocity combination of:

(i) The lightest commercially available fastener designed for that specific tool;

(ii) The strongest commercially available power load that will properly chamber in the tool;

(iii) The piston designed for that tool and appropriate for that fastener; that will produce an average test velocity from the ten tests not in excess of 100 meters per second (328 feet per second) with no single test having a velocity of over 108 m/s (354 ft/s).

(d) Medium-velocity tool – a tool whose test velocity has been measured ten times while utilizing the highest velocity combination of:

(i) The lightest commercially available fastener designed for the tool;

(ii) The strongest commercially available power load that will properly chamber in the tool;

(iii) The piston designed for that tool and appropriate for that fastener; that will produce an average test velocity from ten tests in excess of 100 m/s (328 ft/s) but not in excess of 150 m/s (492 ft/s) with no single test having a velocity of 160 m/s (525 ft/s).

(e) High-velocity tool – a tool whose test velocity has been measured ten times while utilizing the combination of:

(i) The lightest commercially available fastener designed for the tool;

(ii) The strongest commercially available power load which will properly chamber in the tool; that will produce an average velocity from the ten tests in excess of 150 m/s (492 ft/s).

[Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-36305, filed 1/21/86.]

#### WAC 296-155-36307 Requirements. (1) General.

(a) The tool shall be designed to prevent inadvertent actuation.

(b) The tool shall be designed to prevent actuation when dropped in any attitude from a height of 3 meters (10 ft) onto a smooth, hard surface such as concrete or steel, if such actuation can propel a fastener or any part thereof in free flight.

(c) Actuation of the tool shall be dependent upon at least two separate and distinct operations by the operator, with at least one operation being separate from the operation of holding the tool against the work surface.

(d) The tool shall be designed not to be operable other than against a work surface with a force on the work surface equal to 22 newtons (5 lb) greater than the weight of the tool or a minimum impact energy of 4 joules (3 ft-lb).

(e) All tools shall be designed so that compatible protective shields or fixtures, designed, built, and supplied by the manufacturer of the tool, can be used (see WAC 296-155-36307 (2)(b), (3)(b), (4)(b) and 296-155-36313(8)).

(f) The tool shall be designed so that a determinable means of varying the power levels is available for selecting a power level adequate to perform the desired work (see WAC 296-155-36309(5)).

(g) The tool shall be designed so that all principal functional parts can be checked for foreign matter that may affect operation.

(h) The tool shall be designed so that all parts will be of adequate strength to resist maximum stresses imposed upon actuation when the tool is used in accordance with the manufacturer's instructions and is powered by any commercially available power load which will properly chamber in the tool.

(i) Each tool shall bear a legible permanent model designation, which shall serve as a means of identification. Each tool shall also bear a legible, permanent manufacturer's unique serial number.

(j) A lockable container shall be provided for each tool. The words "POWDER ACTUATED TOOL" shall appear in plain sight on the outside of the container. The following notice shall be attached on the inside cover of the container:

"WARNING – POWDER ACTUATED TOOL. TO BE USED ONLY BY A QUALIFIED OPERATOR AND KEPT UNDER LOCK AND KEY WHEN NOT IN USE."

(k) Each tool shall bear a durable warning label with the following statement, or the equivalent:

"WARNING - FOR USE ONLY BY QUALIFIED OPERATORS  
ACCORDING TO MANUFACTURER'S INSTRUCTION  
MANUAL."

- (l) Each tool shall be supplied with the following:
  - (i) Operator's instruction and service manual.
  - (ii) Power load chart.
  - (iii) Tool inspection record.
  - (iv) Service tools and accessories.

(m) In determining tool test velocities, the velocity of the fastener shall be measured in free flight at a distance of 2 meters (6-1/2 ft) from the muzzle end of the tool, using accepted ballistic test methods.

(2) Design requirements - low-velocity class.

(a) Low-velocity tools, indirect-acting (piston) type, as defined in WAC 296-155-36305, shall meet the requirements of WAC 296-155-36307(1).

(b) A shield shall be supplied with each tool.

(3) Design requirements - medium-velocity class.

(a) Medium-velocity tools, indirect-acting (piston) type, as defined in WAC 296-155-36305, shall meet the requirements of WAC 296-155-36307(1).

(b) The tool shall have a shield at least 63 mm (2-1/2 in) in diameter mounted perpendicular to, and concentric with, the muzzle end, when it is indexed to the center position. A special shield or fixture may be used when it provides equivalent protection.

(c) The tool shall be designed so that it cannot be actuated unless it is equipped with a shield or fixture.

(d) The tool shall be designed with angle control so that it will not actuate when equipped with the standard shield indexed to the center position if the bearing surface of the shield is tilted more than 12 degrees from a flat surface.

(4) Design requirements - high-velocity class.

(a) High-velocity tools, direct-acting or indirect-acting type, as defined in WAC 296-155-36305, shall meet the requirements of WAC 296-155-36307(1).

(b) The tool shall have a shield at least 88 mm (3-1/2 in) in diameter mounted perpendicular to, and concentric with, the muzzle end, when it is indexed to the center position. A special shield or fixture may be used when it provides equivalent protection.

(c) The tool shall be designed so that it cannot be actuated unless it is equipped with a shield or fixture.

(d) The tool shall be designed with angle control so that it will not actuate when equipped with the standard shield indexed to the center position, if the bearing surface of the shield is tilted more than eight degrees from a flat surface.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-36307, filed 1/21/86.]

**WAC 296-155-36309 Power loads.** (1) Identification of cased power loads. Cased power loads shall be coded to identify power load levels by case color and power load color as specified in Table G-1.

(2) Identification of caseless power loads. Caseless power loads shall be coded to identify power load levels by power load color as specified in Table G-1 and by configuration.

[Title 296 WAC—p 1948]

(3) Power load use limitation. No power load (cased or caseless) shall be used if it will properly chamber in any existing commercially available tool and will cause a fastener to have a test velocity in excess of the maximum test velocities specified for the said tool.

(4) Identification of power load packages. Power load packages shall provide a visual number-color indication of the power level of the power load as specified in Table G-1.

TABLE G-1

Power Load Identification

Power Level	Color Identification		Nominal velocity	
	Case Color	Load Color	Meters per Second (± 13.5)	Feet per Second (± 45)
1	Brass	Gray	91	300
2	Brass	Brown	119	390
3	Brass	Green	146	480
4	Brass	Yellow	174	570
5	Brass	Red	201	660
6	Brass	Purple	229	750
7	Nickel	Gray	256	840
8	Nickel	Brown	283	930
9	Nickel	Green	311	1020
10	Nickel	Yellow	338	1110
11	Nickel	Red	366	1200
12	Nickel	Purple	393	1290

Note: The nominal velocity applies to a 9.53 mm (3/8-in) diameter 22.7-gram (350-grain) ballistic slug fired in a test device and has no reference to actual fastener velocity developed in any specific tool.

(5) Optional power load variation. Where means other than power loads of varying power levels are to be used to control penetration, such means shall provide an equivalent power level variation.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-36309, filed 1/21/86.]

**WAC 296-155-36311 Fasteners.** Fasteners for use in powder actuated tools shall be designed and manufactured to function compatibly with these tools and, when used in masonry, concrete, or steel, to effect properly the application for which they are recommended.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-36311, filed 1/21/86.]

**WAC 296-155-36313 Operation.** (1) Acceptable tools. Only tools meeting the requirements of this standard shall be used.

(2) Qualified operators. Only qualified operators shall operate tools.

(3) Use lowest velocity. The lowest velocity class of tool that will properly set the fastener shall be used.

(4) Operating limitations. Tools shall be operated in strict accordance with the manufacturer's instructions.

(5) Personal protection. Eye or face protection, or both, shall be worn by operators, assistants, and adjacent personnel when tool is in use. Hearing protection shall be used when making fastenings in confined areas.

(6) Daily inspections. Each day, prior to use, the operator shall inspect the tool to determine that it is in

proper working condition in accordance with the testing methods recommended by the manufacturer of the tool.

(7) Defective tools. Any tool found not to be in proper working condition shall be immediately removed from service and tagged "DEFECTIVE"; it shall not be used until it has been properly repaired in accordance with the manufacturer's instructions.

(8) Proper accessories. The proper shield, fixture, adapter, or accessory, suited for the application, as recommended and supplied by the manufacturer, shall be used.

(9) Proper loads and fasteners. Only those types of fasteners and power loads recommended by the tool manufacturer shall be used.

(10) Questionable material. Before fastening into any questionable material, the operator shall determine its suitability by using a fastener as a center punch. If the fastener point does not easily penetrate, is not blunted, and does not fracture the material, initial test fastenings shall then be made in accordance with the tool manufacturer's recommendations. (See WAC 296-155-36315(3).)

(11) Tool safety. No tool shall be loaded unless it is being prepared for immediate use. If the work is interrupted after loading, the tool shall be unloaded at once.

(12) Powder actuated magazine or clip-fed tools are not considered loaded unless a power load is actually in the ram (firing chamber), even though the magazine or clip is inserted in the tool. If work is interrupted, the firing chamber shall be cleared and the magazine or clip removed.

(13) Pointing tools. Tools shall not be loaded until just prior to the intended firing time. Neither loaded nor empty tools are to be pointed at any person; hands shall be kept clear of the open barrel end.

(14) Tool perpendicular to work. The tool shall always be held perpendicular to the work surface when fastening into any material, except for specific applications recommended by the tool manufacturer.

(15) Misfires. In the event of a misfire, the operator shall hold the tool firmly against the work surface for a period of thirty seconds and then follow the explicit instructions set forth in the manufacturer's instructions.

(16) Different power levels. Power loads of different power levels and types shall be kept in separate compartments or containers.

(17) Signs. A sign, at least 20 x 25 cm (8 x 10 in), using boldface type no less than 2.5 cm (1 in) in height, shall be posted in plain sight on all construction projects where tools are used. The sign shall bear wording similar to the following: "POWDER ACTUATED TOOL IN USE."

[Statutory Authority: Chapter 49.17 RCW. 89-11-035 (Order 89-03), § 296-155-36313, filed 5/15/89, effective 6/30/89. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-36313, filed 1/21/86.]

**WAC 296-155-36315 Limitations of use.** (1) Explosive and flammable atmospheres. The tool shall not be used in an explosive or flammable atmosphere.

(2) Unattended tools prohibited. A tool shall never be left unattended in a place where it would be available to unauthorized persons.

(3) Fasteners in hard, brittle areas. Fasteners shall not be driven into very hard or brittle materials including, but not limited to, cast iron, glazed tile, hardened steel, glass block, natural rock, hollow tile, or most brick. (See WAC 296-155-36313(10).)

(4) Fasteners in soft materials. Fasteners shall not be driven into easily penetrated or thin materials, or materials of questionable resistance, unless backed by a material that will prevent the fastener from passing completely through the other side.

(5) Fasteners in steel. Fasteners shall not be driven closer than 13 mm (1/2 in) from the edge of steel except for specific applications recommended by the tool manufacturer.

(6) Fasteners in masonry. Fasteners shall not be driven closer than 7.5 cm (3 in) from the unsupported edge of masonry materials except for specific applications recommended by the tool manufacturer.

(7) Fasteners in concrete. Fasteners shall not be driven into concrete unless material thickness is at least three times the fastener shank penetration.

(8) Fasteners in spalls. Fasteners shall not be driven into any spalled area.

(9) Fasteners in existing holes. Fasteners shall not be driven through existing holes unless a specific guide means, as recommended and supplied by the tool manufacturer, is used to ensure positive alignment.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-36315, filed 1/21/86.]

**WAC 296-155-36317 Maintenance and storage.** (1) Use of tools. The tool shall be serviced and inspected for worn or damaged parts at regular intervals as recommended by the tool manufacturer. Prior to the tool being put back into use, all worn or damaged parts shall be replaced by a qualified person using only parts supplied by the tool manufacturer. A record of this inspection shall be noted and dated on the tool inspection record.

(2) Instruction manuals. Instruction manuals, maintenance tools, and accessories supplied with the tool shall be stored in the tool container when not in use.

(3) Security. Powder actuated tools and power loads shall be locked in a container and stored in a safe place when not in use and shall be accessible only to authorized personnel.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-36317, filed 1/21/86.]

**WAC 296-155-36319 Authorized instructor.** (1) Operator qualifications. Only persons trained and authorized by the tool manufacturer or by an authorized representative of the tool manufacturer shall be qualified to instruct and qualify operators for the manufacturer's powder actuated tools.

(2) Instructor qualifications. All authorized instructors shall have read and be familiar with this standard, and shall be capable of:



- (a) Disassembling, servicing, and reassembling the tool.
- (b) Recognizing any worn or damaged parts or defective operation.
- (c) Recognizing and clearly identifying the colors used to identify power load levels.
- (d) Using the tool correctly within the limitations of its use.
- (e) Training and testing operators prior to issuing a qualified operator's card.

(3) Instructor's card. All authorized instructors shall have in their possession a valid authorized instructor's card issued and signed by an authorized representative of the manufacturer. The card shall be wallet size of approximately 6 x 9 cm (2-1/2 x 3-1/2 in), and the face of the card shall bear text similar to that shown in Figure G-1.

(4) List of instructors. A list of all instructors authorized by the manufacturer to instruct and qualify operators shall be maintained by the tool manufacturer and be made available to the department of labor and industries, division of industrial safety and health, upon request.

(5) Revocation of instructor card. An instructor's card may be revoked by the authorizing agent or the department of labor and industries, division of industrial safety and health, if he is known to have issued a qualified operator's card in violation of any regulation contained in this standard. When an instructor is no longer authorized to issue qualified operator's cards, he shall surrender his card to the authorizing agent or the department of labor and industries, division of industrial safety and health.

AUTHORIZED INSTRUCTOR

----- Powder Actuated Tools    Date -----  
 (MAKE)  
 Card No. ----- Social Security No. -----  
 This certifies that -----  
 (NAME OF INSTRUCTOR)  
 has received the prescribed training in the operation and maintenance of powder actuated tools manufactured by -----  
 ----- and is qualified  
 (NAME OF MANUFACTURER)  
 to train and certify operators of -----  
 (MAKE)  
 powder actuated tools.  
 Model(s) -----  
 Authorized by -----  
 I have received instruction by the manufacturer's authorized representative in the training of operators of the above tools and agree to conform to all rules and regulations governing the instruction of tool operators.  
 Date of Birth -----

(SIGNATURE)

Figure G-1  
Sample of Authorized Instructor's Card

[Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-36319, filed 1/21/86.]

**WAC 296-155-36321 Qualified operator.** (1) Operator qualifications. The operator shall be trained by an authorized instructor to be familiar with the provisions

of this standard and the instructions provided by the manufacturer for operation and maintenance. The operator shall also be capable of:

- (a) Reading and understanding the manufacturer's instruction manual.
- (b) Cleaning the tool correctly.
- (c) Recognizing any worn or damaged parts or defective operation.
- (d) Recognizing the number-color code system used in this standard to identify power load levels. In the event the operator is unable to distinguish the colors used, he shall be given special instruction to enable him to avoid error.
- (e) Using the tool correctly within the limitations of its use and demonstrating his competence by operating the tool in the presence of the instructor.

(2) Operator examination. After training, the operator shall, to substantiate his competency, satisfactorily complete a written examination provided by the manufacturer of the tool.

(a) The operator's written examination shall consist of questions to establish the operator's competence with respect to:

- (i) The requirements of this standard;
- (ii) The powder actuated fastening system; and
- (iii) The specific details of operation and maintenance of the tool(s) involved.

(b) The examination shall provide a statement, attested to by the instructor, that the applicant can (or cannot) readily distinguish the colors used to identify power load levels (see WAC 296-155-36309).

(3) Operator's card. Each applicant who meets the requirements as set forth in subsections (1) and (2) of this section shall receive a qualified operator's card, issued and signed by both the instructor and applicant. While using the tool, the operator shall have this card in his possession.

(4) Card features. The qualified operator's card supplied by the manufacturer shall be wallet size of approximately 6 x 9 cm (2-1/2 x 3-1/2 in), and the face of the card shall bear text similar to that shown in Figure G-2.

(5) Revocation notation. There shall be printed on the card a notation reading:

"Revocation of card - Failure to comply with any of the rules and regulations for safe operation of powder actuated fastening tools shall be cause for the immediate revocation of this card."

QUALIFIED OPERATOR

----- Powder Actuated Tools    Date -----  
 (MAKE)  
 Card No. ----- Social Security No. -----  
 This certifies that -----  
 (NAME OF OPERATOR)  
 has received the prescribed training in the operation of powder actuated tools manufactured by -----  
 -----  
 (NAME OF MANUFACTURER)  
 Model(s) -----  
 Trained and issued by -----  
 -----  
 (SIGNATURE OF AUTHORIZED INSTRUCTOR)

I have received instruction in the safe operation and maintenance of powder actuated fastening tools of the makes and models specified and agree to conform to all rules and regulations governing that use

Date of Birth -----

-----  
(SIGNATURE)

Figure G-2  
Sample of Qualified Operator's Card

[Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-36321, filed 1/21/86.]

**WAC 296-155-365 Abrasive wheels and tools.** (1) Power. All grinding machines shall be supplied with sufficient power to maintain the spindle speed at safe levels under all conditions of normal operation.

(2) Guarding. Grinding machines shall be equipped with safety guards in conformance with the requirements of American National Standards Institute, B7.1-1978, Safety Code for the Use, Care and Protection of Abrasive Wheels.

(3) Use of abrasive wheels.

(a) Floor stand and bench mounted abrasive wheels, used for external grinding, shall be provided with safety guards (protection hoods). The maximum angular exposure of the grinding wheel periphery and sides shall be not more than 90°, except that when work requires contact with the wheel below the horizontal plane of the spindle, the angular exposure shall not exceed 125°. In either case, the exposure shall begin not more than 65° above the horizontal plane of the spindle. Safety guards shall be strong enough to withstand the effect of a bursting wheel.

(b) Floor and bench-mounted grinders shall be provided with work rests which are rigidly supported and readily adjustable. Such work rests shall be adjusted to a distance not to exceed one-eighth inch from the surface of the wheel. The work rest may be omitted when contacts of the work piece with the grinding surface below the horizontal plane of the spindle are necessary and unavoidable, or where the size or shape of the work piece precludes use of the work rest.

(c) Cup type wheels used for external grinding shall be protected by either a revolving cup guard or a band type guard in accordance with the provisions of the American National Standards Institute, B7.1-1978, Safety Requirements for the Use, Care, and Protection of Abrasive Wheels. Abrasive wheels shall only be used on machines provided with safety guards, except the following:

(i) Wheels used for internal work while within the work being ground.

(ii) Mounted wheels, 2 inches and smaller in diameter used in portable operations.

(iii) Types 16, 17, 18, 18R and 19 cones and plugs, and threaded hole pot balls where the work offers protection or where the size does not exceed 3 inches in diameter by 5 inches in length.

(iv) Metal centered diamond lapidary wheels either notched, segmented or continuous rim used with a coolant deflector, when operated at speeds up to 3500 surface feet per minute (S.F.P.M.).

(v) Type 1 wheels not larger than 2 inches in diameter and not more than 1/2 inch thick, operating at peripheral speeds less than 1800 SFPM when mounted on mandrels driven by portable drills.

(vi) Type 1 reinforced wheels not more than 3 inches in diameter and 1/4 inch in thickness, operating at peripheral speeds not exceeding 9500 SFPM, provided that safety glasses and face shield are worn.

(vii) Valve seat grinding wheels.

(d) Portable abrasive wheels used for internal grinding shall be provided with safety flanges (protection flanges) meeting the requirements of subdivision (f) of this subsection, except as follows:

(i) When wheels 2 inches or less in diameter which are securely mounted on the end of a steel mandrel are used;

(ii) If the wheel is entirely within the work being ground while in use.

(e) When safety guards are required, they shall be so mounted as to maintain proper alignment with the wheel, and the guard and its fastenings shall be of sufficient strength to retain fragments of the wheel in case of accidental breakage. The maximum angular exposure of the grinding wheel periphery and sides shall not exceed 180°.

(f) When safety flanges are required, they shall be used only with wheels designed to fit the flanges. Only safety flanges, of a type and design and properly assembled so as to ensure that the pieces of the wheel will be retained in case of accidental breakage, shall be used.

(g) All abrasive wheels shall be closely inspected and ring-tested before mounting to ensure that they are free from cracks or defects.

(h) Grinding wheels shall fit freely on the spindle and shall not be forced on. The spindle nut shall be tightened only enough to hold the wheel in place.

(i) All employees using abrasive wheels shall be protected by eye protection equipment in accordance with the requirements of Part C of this chapter, except when adequate eye protection is afforded by eye shields which are permanently attached to the bench or floor stand.

(4) Other requirements. All abrasive wheels and tools used by employees shall meet other applicable requirements of American National Standards Institute, B7.1-1978, Safety Code for the Use, Care and Protection of Abrasive Wheels.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-365, filed 1/21/86; Order 74-26, § 296-155-365, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-367 Masonry saws.** (1) Operating requirements. Masonry saws shall be constructed, guarded, and operated in accordance with ANSI A10.9-1983, Safety Requirements for Concrete Construction and Masonry Work.

(2) Guarding. Masonry saws shall be guarded by semicircular enclosures over the blade and by a slotted horizontal hinged bar mounted underneath the enclosure to retain fragments of the blade in case it should shatter while in use.

(3) Safety latch. A safety latch shall be installed on notched saws to prevent the motor and cutting head assembly from lifting out of the notches.

(4) Blade speed. Blade speed shall be maintained in accordance with the manufacturer's specifications.

(5) Exhaust and eye protection.

(a) All table mounted masonry saws shall be equipped with a mechanical means of exhausting dust into a covered receptacle or be provided with water on the saw blade for dust control. The operator and any nearby worker shall wear appropriate eye protection in accordance with WAC 296-155-215.

(b) All portable hand-held masonry saw operators shall wear appropriate eye and respiratory protection in accordance with WAC 296-155-215 and chapter 296-62 WAC.

(6) Grounding. The motor frames of all stationary saws shall be grounded through conduit, water pipe, or a driven ground. Portable saws shall be grounded through three-pole cords attached to grounded electrical systems.

(7) Inspection. Masonry saws shall be inspected at regular intervals and maintained in safe operating condition.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-367, filed 1/21/86.]

**WAC 296-155-370 Woodworking tools. (1) Speeds.** No saw shall be operated in excess of the manufacturers recommended speed.

(2) Guarding. All portable, hand held power-driven circular saws shall be equipped with guards above and below the base plate or shoe. The upper guard shall cover the saw to the depth of the teeth, except for the minimum arc required to permit the base to be tilted for bevel cuts. The lower guard shall cover the saw to the depth of the teeth, except for the minimum arc required to allow proper retraction and contact with the work. When the tool is withdrawn from the work, the lower guard shall automatically and instantly return to the covering position.

(3) Hand-fed table saws.

(a) Each circular hand-fed table saw shall be provided with a hood-type guard that will cover the blade at all times when the blade is not in use. This may be accomplished by the use of a guard that will automatically adjust to the thickness of the material being cut, or by a fixed or manually adjusted guard. If a fixed or manually adjusted guard is used, the space between the bottom of the guard and the material being cut shall not exceed 3/8 inch if 1-1/2 inches or more from the blade, and 1/4 inch if closer than 1-1/2 inches.

(b) When the blade is in use, the hood-type guard shall enclose that portion of the blade above the material.

(c) Hood-type guards shall be so designed and constructed as to resist blows and strains incidental to reasonable operation, adjusting, and handling, in order to protect the operator from flying splinters and broken saw teeth.

(d) The hood shall be so mounted as to ensure that its operation will be positive, reliable, and in alignment with

the saw. The mounting shall be adequate to resist any reasonable side thrust or other force that would disrupt alignment.

(e) Where a hood-type guard cannot be used because of unusual shapes or cuts, a jig or fixture that will provide equal safety for the operator shall be used. On the completion of such operations, the guard shall be immediately replaced.

(f) A push stick shall be used on short or narrow stock when there is a possibility of the hand contacting the cutting tool.

(g) Each hand-fed circular rip saw shall be equipped with a spreader to minimize the possibility of material squeezing the saw or of material kickbacks. The spreader shall be made of tempered steel, or its equivalent, and shall be slightly thinner than the saw kerf. It shall be of sufficient width to provide adequate stiffness or rigidity to resist any reasonable side thrust or blow tending to bend or throw it out of position. The spreader shall be attached so that it will remain in true alignment with the blade, even when either the saw or table is tilted, and should be placed so that there is not more than 1/2-inch space between the spreader and the back of the blade when the recommended saw blade is in its maximum "up" position. If a blade smaller than the maximum permissible size is used, the spreader shall be moved to within 1/2 inch of the blade. The provision of a spreader in connection with grooving, dadoing, or rabbeting is not required. On the completion of such operations, the spreader shall be immediately replaced.

(h) Each hand-fed circular rip saw shall be provided with antikickback devices so located as to oppose the thrust or tendency of the saw blade to pick up the material or throw it back toward the operator. These devices shall be designed to provide holding power for all the thicknesses of material being cut.

(4) Radial saws.

(a) Hoods and guards. Each saw shall be provided with a device that will completely enclose the upper portion of the blade down to a point that includes the end of the saw arbor. The upper hood shall be so constructed as to protect the operator from flying splinters and broken saw teeth, and to deflect sawdust away from the operator. The sides of the lower exposed portion of the saw blade shall be guarded from the tips of the blade teeth inward radially with no greater than 3/8-inch gullet exposure. The device shall automatically adjust itself to the thickness of the stock and remain in contact with the stock being cut for the 90° blade positions (0° bevel) throughout the full working range of miter position. A permanent label not less than 1-1/2 inches X 3/4 inch shall be affixed to the guard visible from the normal operating position, reading as follows:

**WARNING: TO AVOID INJURY, SHUT OFF POWER BEFORE CLEARING A JAMMED LOWER GUARD**

Such a label shall be colored standard danger red or orange in accordance with American National Standard Safety Color Code for Marking Physical Hazards, Z53.1-1979.

(b) Spreaders. When radial saws are used for ripping, a spreader shall be provided and shall be aligned with the saw blade.

(c) Antikickback devices. Antikickback devices located on both sides of the saw blade on the outfeed side, so as to oppose the thrust or tendency of the blade to pick up the material or to throw it back toward the operator, shall be used on each radial saw used for ripping. These devices shall be designed to provide adequate holding power for all the thicknesses of material being cut.

(d) Adjustable stops and return devices. An adjustable stop shall be provided to prevent the forward travel of the blade beyond the position necessary to complete the cut. A limit chain or other equally effective device shall be provided to prevent the saw blade from sliding beyond the edge of the table; or the table shall be extended to eliminate over-run.

(e) On any manually operated saw, installation shall be such that the front of the machine is slightly higher than the rear, or some other means shall be provided so that the cutting head will not roll or move out on the arm away from the column as a result of gravity or vibration. A permanent label not less than 1-1/2 inches X 3/4 inch shall be affixed to the cutting head visible from the normal crosscut operating position, reading as follows:

**WARNING: TO AVOID INJURY, RETURN CARRIAGE TO THE FULL REAR POSITION AFTER EACH CROSSCUT TYPE OF OPERATION**

Such a label shall be colored standard caution yellow in accordance with American National Standard Z53.1-1979.

(f) Direction of feed. Ripping and ploughing shall be against the direction in which the saw blade turns. The direction of the saw blade rotation shall be conspicuously marked on the hoods. In addition, a permanent label not less than 1-1/2 inches X 3/4 inch shall be affixed to the end of the guard at which the blade teeth exit the upper guard during operation. The label shall be at approximately the level of the arbor and shall read as follows:

**DANGER: TO AVOID INJURY, DO NOT FEED MATERIAL INTO CUTTING TOOL FROM THIS END**

Such a label shall be colored standard red or orange in accordance with American National Standard, Z53.1-1979.

(5) All woodworking tools and machinery shall meet any other applicable requirements of American National Standards Institute, 01.1-1971, Safety Code for Woodworking Machinery.

(6) The control switch on all stationary radial arm saws shall be placed at the front of the saw or table and shall be properly recessed or hooded to prevent accidental contact.

(a) A firm level working area shall be provided at the front of all stationary radial arm saws. The area shall be kept free of all stumbling hazards.

(b) A push stick or similar device shall be used for pushing short material through power saws.

(7) Circular power miter saws. The requirements of subsection (4)(a) of this section applies to guarding circular power miter saws.

(8) Personal protective equipment. All personal protective equipment required for use shall conform to the requirements of Part C of this chapter.

[Statutory Authority: Chapter 49.17 RCW. 89-11-035 (Order 89-03), § 296-155-370, filed 5/15/89, effective 6/30/89. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-370, filed 1/21/86; Order 74-26, § 296-155-370, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-375 Jacks—Lever and ratchet, screw, and hydraulic.** (1) General requirements.

(a) The manufacturer's rated capacity shall be legibly marked on all jacks and this capacity shall not be exceeded.

(b) All jacks shall have a positive stop to prevent over-travel.

(c) Specially designed jacks constructed for specific purposes shall meet the approval of the division of Industrial Safety and Health before being placed in service.

(d) Control parts shall be so designed that the operator will not be subjected to hazard.

(2) Lift slab construction.

(a) Hydraulic jacks used in lift slab construction shall have a safety device which will cause the jacks to support the load in any position in the event the jack malfunctions.

(b) If lift slabs are automatically controlled, a device shall be installed which will stop the operation when the 1/2-inch leveling tolerance is exceeded.

(3) Blocking. When it is necessary, to provide a firm foundation, the base of the jack shall be blocked or cribbed. Where there is a possibility of slippage of the metal cap of the jack, a wood block shall be placed between the cap and the load.

[Order 74-26, § 296-155-375, filed 5/7/74, effective 6/6/74.]

## Part H

### WELDING AND CUTTING

#### WAC

296-155-400	Gas welding and cutting.
296-155-405	Arc welding and cutting.
296-155-407	Protective clothing.
296-155-410	Fire prevention.
296-155-415	Ventilation and protection in welding, cutting, and heating.
296-155-420	Welding, cutting, and heating in way of preservative coatings.

**WAC 296-155-400 Gas welding and cutting.** (1) Transporting, moving, and storing compressed gas cylinders.

(a) Valve protection caps shall be in place and secured.

(b) When cylinders are hoisted, they shall be secured on a cradle, slingboard, or pallet. They shall not be hoisted or transported by means of magnets or choker slings.

(c) Cylinders shall be moved by tilting and rolling them on their bottom edges. They shall not be intentionally dropped, struck, or permitted to strike each other violently.

(d) When cylinders are transported by powered vehicles, they shall be secured in a vertical position.

(e) Valve protection caps shall not be used for lifting cylinders from one vertical position to another. Bars shall not be used under valves or valve protection caps to pry cylinders loose when frozen. Warm, not boiling, water shall be used to thaw cylinders loose.

(f) Unless cylinders are firmly secured on a special carrier intended for this purpose, regulators shall be removed and valve protection caps put in place before cylinders are moved.

(g) A suitable cylinder truck, chain, or other steadying device shall be used to keep cylinders from being knocked over while in use. Such cylinders are not considered to be "in storage."

(h) When a job is finished, when cylinders are empty or when cylinders are moved at any time, the cylinder valve shall be closed.

(i) Compressed gas cylinders shall be secured in an upright position at all times except, if necessary, for short periods of time while cylinders are actually being hoisted or carried.

(j) Oxygen. Oxygen cylinders in storage shall be separated from fuel-gas cylinders or combustible materials (especially oil or grease), a minimum distance of 20 feet or by a noncombustible barrier at least 5 feet high having a fire-resistance rating of at least one-half hour.

#### (2) Placing cylinders.

(a) Cylinders shall be kept far enough away from the actual welding or cutting operation so that sparks, hot slag, or flame will not reach them. When this is impractical, fire resistant shields shall be provided.

(b) Cylinders shall be placed where they cannot become part of an electrical circuit. Electrodes shall not be struck against a cylinder to strike an arc.

(c) Fuel gas cylinders shall be placed with valve end up whenever they are in use. They shall not be placed in a location where they would be subject to open flame, hot metal, or other sources of artificial heat.

(d) Cylinders containing oxygen or acetylene or other fuel gas shall not be taken into confined spaces.

#### (3) Treatment of cylinders.

(a) Cylinders, whether full or empty, shall not be used as rollers or supports.

(b) No person other than the gas supplier shall attempt to mix gases in a cylinder. No one except the owner of the cylinder or person authorized by him, shall refill a cylinder. No one shall use a cylinder's contents for purposes other than those intended by the supplier. All cylinders used shall meet the department of transportation requirements, Specification for Cylinders, (49 CFR Part 178, Subpart C).

(c) No damaged or defective cylinder shall be used.

(4) Use of fuel gas. The employer shall thoroughly instruct employees in the safe use of fuel gas, as follows:

(a) Before a regulator to a cylinder valve is connected, the valve shall be opened slightly and closed immediately. (This action is generally termed "cracking" and is intended to clear the valve of dust or dirt that might otherwise enter the regulator.) The person cracking the valve shall stand to one side of the outlet, not in front of it. The valve of a fuel gas cylinder shall not be cracked where the gas would reach welding work, sparks, flame, or other possible sources of ignition.

(b) The cylinder valve shall always be opened slowly to prevent damage to the regulator. For quick closing, valves on fuel gas cylinders shall not be opened more than 1 1/2 turns. When a special wrench is required, it shall be left in position on the stem of the valve while the cylinder is in use so that the fuel gas flow can be shut off quickly in case of an emergency. In the case of manifolded or coupled cylinders, at least one such wrench shall always be available for immediate use. Nothing shall be placed on top of a fuel gas cylinder, when in use, which may damage the safety device or interfere with the quick closing of the valve.

(c) Fuel gas shall not be used from cylinders through torches or other devices which are equipped with shutoff valves without reducing the pressure through a suitable regulator attached to the cylinder valve or manifold.

(d) Before a regulator is removed from a cylinder valve, the cylinder valve shall always be closed and the gas released from the regulator.

(e) If, when the valve on a fuel gas cylinder is opened, there is found to be a leak around the valve stem, the valve shall be closed and the gland nut tightened. If this action does not stop the leak, the use of the cylinder shall be discontinued, and it shall be properly tagged and removed from the work area. In the event that fuel gas should leak from the cylinder valve, rather than from the valve stem, and the gas cannot be shut off, the cylinder shall be properly tagged and removed from the work area. If a regulator attached to a cylinder valve will effectively stop a leak through the valve seat, the cylinder need not be removed from the work area.

(f) If a leak should develop at a fuse plug or other safety device, the cylinder shall be removed from the work area.

(g) Cylinders not having fixed hand wheels shall have keys, handles, or nonadjustable wrenches on valve stems while in service. In multiple cylinder installations one and only one key or handle is required for each manifold.

#### (5) Fuel gas and oxygen manifolds.

(a) Fuel gas and oxygen manifolds shall bear the name of the substance they contain in letters at least 1-inch high which shall be either painted on the manifold or on a sign permanently attached to it.

(b) Fuel gas and oxygen manifolds shall be placed in safe, well ventilated, and accessible locations. They shall not be located within enclosed spaces.

(c) Manifold hose connections, including both ends of the supply hose that lead to the manifold, shall be such that the hose cannot be interchanged between fuel gas and oxygen manifolds and supply header connections. Adapters shall not be used to permit the interchange of

hose. Hose connections shall be kept free of grease and oil.

(d) When not in use, manifold and header hose connections shall be capped.

(e) Nothing shall be placed on top of a manifold, when in use, which will damage the manifold or interfere with the quick closing of the valves.

(6) Hose.

(a) Fuel gas hose and oxygen hose shall be easily distinguishable from each other. The contrast may be made by different colors or by surface characteristics readily distinguishable by the sense of touch. Oxygen and fuel gas hoses shall not be interchangeable. A single hose having more than one gas passage shall not be used.

(b) When parallel sections of oxygen and fuel gas hose are taped together, not more than 4 inches out of 12 inches shall be covered by tape.

(c) All hose in use, carrying acetylene, oxygen, natural or manufactured fuel gas, or any gas or substance which may ignite or enter into combustion, or be in any way harmful to employees, shall be inspected at the beginning of each working shift. Defective hose shall be removed from service.

(d) Hose which has been subject to flashback, or which shows evidence of severe wear or damage, shall be tested to twice the normal pressure to which it is subject, but in no case less than 300 p.s.i. Defective hose, or hose in doubtful condition, shall not be used.

(e) Hose couplings shall be of the type that cannot be unlocked or disconnected by means of a straight pull without rotary motion.

(f) Boxes used for the storage of gas hose shall be ventilated.

(g) Hoses, cables, and other equipment shall be kept clear of passageways, ladders and stairs.

(7) Torches.

(a) Clogged torch tip openings shall be cleaned with suitable cleaning wires, drills, or other devices designed for such purpose.

(b) Torches in use shall be inspected at the beginning of each working shift for leaking shutoff valves, hose couplings, and tip connections. Defective torches shall not be used.

(c) Torches shall be lighted by friction lighters or other approved devices, and not by matches or from hot work.

(8) Regulators and gauges. Oxygen and fuel gas pressure regulators, including their related gauges, shall be in proper working order while in use.

(9) Oil and grease hazards. Oxygen cylinders and fittings shall be kept away from oil or grease. Cylinders, cylinder caps and valves, couplings, regulators, hose, and apparatus shall be kept free from oil or greasy substances and shall not be handled with oily hands or gloves. Oxygen shall not be directed at oily surfaces, greasy clothes, or within a fuel oil or other storage tank or vessel.

(10) Additional rules. For additional details not covered in this Part, applicable portions of American National Standards Institute, Z49.1-1973, Safety in Welding and Cutting, shall apply.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-400, filed 1/21/86; Order 74-26, § 296-155-400, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-405 Arc welding and cutting. (1) Manual electrode holders.**

(a) Only manual electrode holders which are specifically designed for arc welding and cutting, and are of a capacity capable of safely handling the maximum rated current required by the electrodes, shall be used.

(b) Any current-carrying parts passing through the portion of the holder which the arc welder or cutter grips in his hand, and the outer surfaces of the jaws of the holder, shall be fully insulated against the maximum voltage encountered to ground.

(2) Welding cables and connectors.

(a) All arc welding and cutting cables shall be of the completely insulated, flexible type, capable of handling the maximum current requirements of the work in progress, taking into account the duty cycle under which the arc welder or cutter is working.

(b) Only cable free from repair or splices for a minimum distance of 10 feet from the cable end to which the electrode holder is connected shall be used, except that cables with standard insulated connectors or with splices whose insulating quality is equal to that of the cable are permitted.

(c) When it becomes necessary to connect or splice lengths of cable one to another, substantial insulated connectors of a capacity at least equivalent to that of the cable shall be used. If connections are effected by means of cable lugs, they shall be securely fastened together to give good electrical contact, and the exposed metal parts of the lugs shall be completely insulated.

(d) Cables in need of repair shall not be used. When a cable, other than the cable lead referred to in subdivision (b) of this subsection, becomes worn to the extent of exposing bare conductors, the portion thus exposed shall be protected by means of rubber and friction tape or other equivalent insulation.

(3) Ground returns and machine grounding.

(a) A ground return cable shall have a safe current carrying capacity equal to or exceeding the specified maximum output capacity of the arc welding or cutting unit which it services. When a single ground return cable services more than one unit, its safe current-carrying capacity shall equal or exceed the total specified maximum output capacities of all the units which it services.

(b) Pipelines containing gases or flammable liquids, or conduits containing electrical circuits, shall not be used as a ground return. For welding on natural gas pipelines, the technical portions of regulations issued by the Department of Transportation, Office of Pipeline Safety, Minimum Federal Safety Standards for Gas Pipelines shall apply. (49 CFR Part 192, Subpart C.)

(c) When a structure or pipeline is employed as a ground return circuit, it shall be determined that the required electrical contact exist at all joints. The generation of an arc, sparks, or heat at any point shall cause rejection of the structures as a ground circuit.

(d) When a structure or pipeline is continuously employed as a ground return circuit, all joints shall be



bonded, and periodic inspections shall be conducted to ensure that no condition of electrolysis or fire hazard exists by virtue of such use.

(e) The frames of all arc welding and cutting machines shall be grounded either through a third wire in the cable containing the circuit conductor or through a separate wire which is grounded at the source of the current. Grounding circuits, other than by means of the structure, shall be checked to ensure that the circuit between the ground and the grounded power conductor has resistance low enough to permit sufficient current to flow to cause the fuse or circuit breaker to interrupt the current.

(f) All ground connections shall be inspected to ensure that they are mechanically strong and electrically adequate for the required current.

(4) Operating instructions. Employers shall instruct employees in the safe means of arc welding and cutting as follows:

(a) When electrode holders are to be left unattended, the electrodes shall be removed and the holders shall be so placed or protected that they cannot make electrical contact with employees or conducting objects.

(b) Hot electrode holders shall not be dipped in water; to do so may expose the arc welder or cutter to electric shock.

(c) When the arc welder or cutter has occasion to leave his work or to stop work for any appreciable length of time, or when the arc welding or cutting machine is to be moved, the power supply switch to the equipment shall be opened.

(d) Any faulty or defective equipment shall be reported to the supervisor.

(e) See WAC 296-155-452 for additional requirements.

(5) Shielding. Whenever practical, all arc welding and cutting operations shall be shielded by noncombustible or flameproof screens which will protect employees and other persons working in the vicinity from the direct rays of the arc.

(6) Employee protection. Where welding or cutting operations are being performed in areas where it is possible for molten slag to contact other employees, those employees shall be protected from being burned by providing overhead protection, barricading the impact area, or other effective means.

[Statutory Authority: Chapter 49.17 RCW. 88-23-054 (Order 88-25), § 296-155-405, filed 11/14/88. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-405, filed 1/21/86; Order 74-26, § 296-155-405, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-407 Protective clothing.** (1) General requirements. Employees exposed to the hazards created by welding, cutting, or brazing operations shall be protected by personal protective equipment in accordance with the requirements of WAC 296-24-07501. Appropriate protective clothing required for any welding operation will vary with the size, nature and location of the work to be performed.

(2) Specified protective clothing. Protective means which may be employed are as follows:

(a) Except when engaged in light work, all welders should wear flameproof gauntlet gloves.

(b) Flameproof aprons made of leather, or other suitable material may also be desirable as protection against radiated heat and sparks.

(c) Woolen clothing preferable to cotton because it is not so readily ignited and helps protect the welder from changes in temperature. Cotton clothing, if used, should be chemically treated to reduce its combustibility. All outer clothing such as jumpers or overalls should be reasonably free from oil or grease.

(d) Sparks may lodge in rolled-up sleeves or pockets of clothing, or cuffs of overalls or trousers. It is therefore recommended that sleeves and collars be kept buttoned and pockets be eliminated from the front of overalls and aprons. Trousers or overalls should not be turned up on the outside.

Note: For heavy work, fire-resistant leggings, high boots, or other equivalent means should be used.

(e) In production work a sheet metal screen in front of the worker's legs can provide further protection against sparks and molten metal in cutting operations.

(f) Capes or shoulder covers made of leather or other suitable materials should be worn during overhead welding or cutting operations. Leather skull caps may be worn under helmets to prevent head burns.

(g) For overhead welding and cutting, or welding and cutting in extremely confined spaces, ear protection is sometimes desirable.

(h) Where there is exposure to sharp or heavy falling objects, or a hazard of bumping in confined spaces, hard hats or head protectors shall be used.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-407, filed 1/21/86.]

**WAC 296-155-410 Fire prevention.** (1) When practical, objects to be welded, cut, or heated shall be moved to a designated safe location or, if the objects to be welded, cut, or heated cannot be readily moved, all movable fire hazards in the vicinity shall be taken to a safe place, or otherwise protected.

(2) If the object to be welded, cut, or heated cannot be moved and if all the fire hazards cannot be removed, positive means shall be taken to confine the heat, sparks, and slag, and to protect the immovable fire hazards from them.

(3) No welding, cutting, or heating shall be done where the application of flammable paints, or the presence of other flammable compounds, or heavy dust concentrations creates a hazard.

(4) Suitable fire extinguishing equipment shall be immediately available in the work area and shall be maintained in a state of readiness for instant use.

(5) When the welding, cutting, or heating operation is such that normal fire prevention precautions are not sufficient, additional personnel shall be assigned to guard against fire while the actual welding, cutting, or heating operation is being performed, and for a sufficient period of time after completion of the work to ensure that no possibility of fire exists. Such personnel shall be instructed as to the specific anticipated fire



hazards and how the firefighting equipment provided is to be used.

(6) When welding, cutting, or heating is performed on walls, floors, and ceilings, since direct penetration of sparks or heat transfer may introduce a fire hazard to an adjacent area, the same precautions shall be taken on the opposite side as are taken on the side on which the welding is being performed.

(7) For the elimination of possible fire in enclosed spaces as a result of gas escaping through leaking or improperly closed torch valves, the gas supply to the torch shall be positively shut off at some point outside the enclosed space whenever the torch is not to be used or whenever the torch is left unattended for a substantial period of time, such as during the lunch period. Overnight and at the change of shifts, the torch and hose shall be removed from the confined space. Open end fuel gas and oxygen hoses shall be immediately removed from enclosed spaces when they are disconnected from the torch or other gas-consuming device.

(8) Except when the contents are being removed or transferred, drums, pails, and other containers, which contain or have contained flammable liquids, shall be kept closed. Empty containers shall be removed to a safe area apart from hot work operations or open flames.

(9) Drums, containers, or hollow structures which have contained toxic or flammable substances shall, before welding, cutting, or heating is undertaken on them, either be filled with water or thoroughly cleaned of such substances and ventilated and tested. For welding, cutting and heating on steel pipelines containing natural gas, the pertinent portions of regulations issued by the Department of Transportation, Office of Pipeline Safety, Minimum Federal Safety Standards for Gas Pipelines, shall apply. (49 CFR Part 192, Subpart C.)

(10) Before heat is applied to a drum, container, or hollow structure, a vent or opening shall be provided for the release of any built-up pressure during the application of heat.

[Order 74-26, § 296-155-410, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-415 Ventilation and protection in welding, cutting, and heating.** (1) Mechanical ventilation. For purposes of this section, mechanical ventilation shall meet the following requirements:

(a) Mechanical ventilation shall consist of either general mechanical ventilation systems or local exhaust systems.

(b) General mechanical ventilation shall be of sufficient capacity and so arranged as to produce the number of air changes necessary to maintain welding fumes and smoke within safe limits, as defined in Part B of this chapter.

(c) Local exhaust ventilation shall consist of freely movable hoods intended to be placed by the welder or burner as close as practicable to the work. This system shall be of sufficient capacity and so arranged as to remove fumes and smoke at the source and keep the concentration of them in the breathing zone within safe limits as defined in Part B of this chapter.

(d) Contaminated air exhausted from a working space shall be discharged into the open air or otherwise clear of the source of intake air.

(e) All air replacing that withdrawn shall be clean and respirable.

(f) Oxygen shall not be used for ventilation purposes, comfort cooling, blowing dust from clothing, or for cleaning the work area.

(2) Welding, cutting, and heating in confined spaces.

(a) Except as provided in subdivision (b) of this section and subdivision (b) of subsection (3) of this section, either general mechanical or local exhaust ventilation meeting the requirements of subsection (1) of this section shall be provided whenever welding, cutting, or heating is performed in a confined space.

(b) When sufficient ventilation cannot be obtained without blocking the means of access, employees in the confined space shall be protected by air line respirators in accordance with the requirements of Part C of this chapter, and an employee on the outside of such a confined space shall be assigned to maintain communication with those working within it and to aid them in an emergency.

(3) Welding, cutting, or heating of metals of toxic significance.

(a) Welding, cutting, or heating in any enclosed spaces involving the metals specified in this subsection shall be performed with either general mechanical or local exhaust ventilation meeting the requirements of subsection (1) of this section:

(i) Zinc-bearing base or filler metals or metals coated with zinc-bearing materials.

(ii) Lead base metals;

(iii) Cadmium-bearing filler materials;

(iv) Chromium-bearing metals or metals coated with chromium-bearing materials.

(b) Welding, cutting, or heating in any enclosed spaces involving the metals specified in this subdivision shall be performed with local exhaust ventilation in accordance with the requirements of subsection (1) of this section, or employees shall be protected by air line respirators in accordance with the requirements of Part C of this chapter.

(i) Metals containing lead, other than as an impurity, or metals coated with lead-bearing materials;

(ii) Cadmium-bearing or cadmium-coated base metals;

(iii) Metals coated with mercury-bearing metals;

(iv) Beryllium-containing base or filler metals. Because of its high toxicity, work involving beryllium shall be done with both local exhaust ventilation and air line respirators.

(c) Employees performing such operations in the open air shall be protected by filter-type respirators in accordance with the requirements of Part C of this chapter, except that employees performing such operations on beryllium-containing base or filler metals shall be protected by air line respirators in accordance with the requirements of Part C of this chapter.

(d) Other employees exposed to the same atmosphere as the welders or burners shall be protected in the same manner as the welder or burner.

(4) Inert-gas metal-arc welding.

(a) Since the inert-gas metal-arc welding process involves the production of ultra-violet radiation of intensities of 5 to 30 times that produced during shielded metal-arc welding, the decomposition of chlorinated solvents by ultraviolet rays, and the liberation of toxic fuels and gases, employees shall not be permitted to engage in, or be exposed to the process until the following special precautions have been taken:

(i) The use of chlorinated solvents shall be kept at least 200 feet, unless shielded, from the exposed arc, and surfaces prepared with chlorinated solvents shall be thoroughly dry before welding is permitted on such surfaces.

(ii) Employees in the area not protected from the arc by screening shall be protected by filter lenses meeting the requirements of Part C of this chapter. When two or more welders are exposed to each other's arc, filter lens goggles of a suitable type, meeting the requirements of Part C of this chapter shall be worn under welding helmets. Hand shields to protect the welder against flashes and radiant energy shall be used when either the helmet is lifted or the shield is removed.

(iii) Welders and other employees who are exposed to radiation shall be suitably protected so that the skin is covered completely to prevent burns and other damage by ultraviolet rays. Welding helmets and hand shields shall be free of leaks and openings, and free of highly reflective surfaces.

(iv) When inert-gas metal-arc welding is being performed on stainless steel, the requirements of subdivision (b) of subsection (3) of this section shall be met to protect against dangerous concentrations of nitrogen dioxide.

(5) General welding, cutting, and heating.

(a) Welding, cutting, and heating, not involving conditions or materials described in subsections (2), (3), or (4) of this section, may normally be done without mechanical ventilation or respiratory protective equipment, but where, because of unusual physical or atmospheric conditions, an unsafe accumulation of contaminants exists, suitable mechanical ventilation or respiratory protective equipment shall be provided.

(b) Employees performing any type of welding, cutting, or heating shall be protected by suitable eye protective equipment in accordance with the requirements of Part C of this chapter.

[Order 74-26, § 296-155-415, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-420 Welding, cutting, and heating in way of preservative coatings.** (1) Before welding, cutting, or heating is commenced on any surface covered by a preservative coating whose flammability is not known, a test shall be made by a competent person to determine its flammability. Preservative coatings shall be considered to be highly flammable when scrapings burn with extreme rapidity.

[Title 296 WAC—p 1958]

(2) Precautions shall be taken to prevent ignition of highly flammable hardened preservative coatings. When coatings are determined to be highly flammable, they shall be stripped from the area to be heated to prevent ignition.

(3) Protection against toxic preservative coatings:

(a) In enclosed spaces, all surfaces covered with toxic preservatives shall be stripped of all toxic coatings for a distance of at least 4 inches from the area of heat application, or the employees shall be protected by air line respirators, meeting the requirements of Part C of this chapter.

(b) In the open air, employees shall be protected by a respirator, in accordance with requirements of Part C of this chapter.

(4) The preservative coatings shall be removed a sufficient distance from the area to be heated to ensure that the temperature of the unstripped metal will not be appreciably raised. Artificial cooling of the metal surrounding the heating area may be used to limit the size of the area required to be cleaned.

[Order 74-26, § 296-155-420, filed 5/7/74, effective 6/6/74.]

## Part I ELECTRICAL

### WAC

296-155-426	Introduction.
296-155-428	General requirements.
296-155-429	Lockout and tagging of circuits.
296-155-432	Maintenance of equipment.
296-155-434	Environmental deterioration of equipment.
296-155-437	Batteries and battery charging.
296-155-441	Applicability.
296-155-444	General requirements.
296-155-447	Wiring design and protection.
296-155-449	Wiring methods, components, and equipment for general use.
296-155-452	Specific purpose equipment and installations.
296-155-456	Hazardous (classified) locations.
296-155-459	Special systems.
296-155-462	Definitions applicable to this part.

### DISPOSITION OF SECTIONS FORMERLY CODIFIED IN THIS SUBCHAPTER

296-155-425	Definitions applicable to this part. [Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-425, filed 1/21/86; Order 74-26, § 296-155-425, filed 5/7/74, effective 6/6/74.] Repealed by 88-11-021 (Order 88-04), filed 5/11/88. Statutory Authority: Chapter 49.17 RCW.
296-155-430	General requirements. [Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-430, filed 1/21/86; Order 77-20, § 296-155-430, filed 10/18/77; Order 77-12, § 296-155-430, filed 7/11/77; Order 74-26, § 296-155-430, filed 5/7/74, effective 6/6/74.] Repealed by 88-11-021 (Order 88-04), filed 5/11/88. Statutory Authority: Chapter 49.17 RCW.
296-155-435	Grounding and bonding. [Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-435, filed 1/21/86; Order 74-26, § 296-155-435, filed 5/7/74, effective 6/6/74.] Repealed by 88-11-021 (Order 88-04), filed 5/11/88. Statutory Authority: Chapter 49.17 RCW.
296-155-440	Equipment installation and maintenance. [Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-440, filed 1/21/86;

Order 74-26, § 296-155-440, filed 5/7/74, effective 6/6/74.] Repealed by 88-11-021 (Order 88-04), filed 5/11/88. Statutory Authority: Chapter 49.17 RCW.

296-155-450 Battery rooms and battery charging. [Order 74-26, § 296-155-450, filed 5/7/74, effective 6/6/74.] Repealed by 88-11-021 (Order 88-04), filed 5/11/88. Statutory Authority: Chapter 49.17 RCW.

296-155-455 Hazardous locations. [Order 74-26, § 296-155-455, filed 5/7/74, effective 6/6/74.] Repealed by 88-11-021 (Order 88-04), filed 5/11/88. Statutory Authority: Chapter 49.17 RCW.

**WAC 296-155-426 Introduction.** This part addresses electrical safety requirements that are necessary for the practical safeguarding of employees involved in construction work and is divided into four major divisions and applicable definitions as follows:

(1) Introduction and definitions. Definitions applicable to this part are contained in WAC 296-155-462.

(2) Installation safety requirements. Installation safety requirements are contained in WAC 296-155-441 through 296-155-459. Included in this category are electric equipment and installations used to provide electric power and light on jobsites.

(3) Safety-related work practices. Safety-related work practices are contained in WAC 296-155-428 and 296-155-429. In addition to covering the hazards arising from the use of electricity at jobsites, these regulations also cover the hazards arising from the accidental contact, direct or indirect, by employees with all energized lines, above or below ground, passing through or near the jobsite.

(4) Safety-related maintenance and environmental considerations. Safety-related maintenance and environmental considerations are contained in WAC 296-155-432 and 296-155-434.

(5) Safety requirements for special equipment. Safety requirements for special equipment are contained in WAC 296-155-437.

[Statutory Authority: Chapter 49.17 RCW. 88-11-021 (Order 88-04), § 296-155-426, filed 5/11/88.]

**WAC 296-155-428 General requirements.** (1) Protection of employees.

(a) No employer shall permit an employee to work in such proximity to any part of an electric power circuit that the employee could contact the electric power circuit in the course of work, unless the employee is protected against electric shock by de-energizing the circuit and grounding it or by guarding it effectively by insulation or other means.

(b) No person, firm, corporation, or agent of same, shall require or permit any employee to perform any function in proximity to electrical conductors or to engage in any excavation, construction, demolition, repair, or other operation, unless and until danger from accidental contact with said electrical conductors has been effectively guarded by de-energizing the circuit and grounding it or by guarding it by effective insulation or other effective means.

(c) Before work is begun the employer shall ascertain by inquiry or direct observation, or by instruments,

whether any part of an energized electric power circuit, exposed or concealed, is so located that the performance of the work may bring any person, tool, or machine into physical or electrical contact with the electric power circuit. The employer shall post and maintain proper warning signs where such a circuit exists. The employer shall advise employees of the location of such lines, the hazards involved, and the protective measures to be taken.

(d) No work shall be performed, no material shall be piled, stored or otherwise handled, no scaffolding, commercial signs, or structures shall be erected or dismantled, nor any tools, machinery or equipment operated within the specified minimum distances from any energized high voltage electrical conductor capable of energizing the material or equipment; except where the electrical distribution and transmission lines have been de-energized and visibly grounded at point of work, or where insulating barriers not a part of or an attachment to the equipment have been erected, to prevent physical contact with the lines, equipment shall be operated proximate to, under, over, by, or near energized conductors only in accordance with the following:

(i) For lines rated 50 kV. or below, minimum clearance between the lines and any part of the equipment or load shall be ten feet.

(ii) For lines rated over 50 kV. minimum, clearance between the lines and any part of the equipment or load shall be ten feet plus 0.4 inch or each 1 kV. over 50 kV., or twice the length of the line insulator but never less than ten feet.

(e) If relocation of the electrical conductors is necessary, arrangements shall be made with the owners of the lines for such relocation.

(f) Barriers.

(i) Barriers shall be of such character and construction as to effectively provide the necessary protection without creating other hazards or jeopardizing the operation of the electrical circuits.

(ii) Barriers installed within the ten feet clearance from conductors shall be installed only under the supervision of authorized and qualified persons and this shall include a representative of the electrical utility or owner involved.

(g) Exceptions.

(i) These rules do not apply to the construction, reconstruction, operation, and maintenance, of overhead electrical lines, structures, and associated equipment by authorized and qualified electrical workers.

(ii) These rules do not apply to authorized and qualified employees engaged in the construction, reconstruction, operation, and maintenance, of overhead electrical circuits or conductors and associated equipment of rail transportation systems or electrical generating, transmission, distribution and communication systems which are covered by chapters 296-45 and 296-32 WAC.

(h) Special precautions must be taken.

(i) When handling any winch lines, guy wires, or other free cable, wire or rope in the vicinity of any electrical conductors.

(ii) When pulling a winch line, or other cable or rope under energized electrical conductors from a boom, mast, pile driver, etc., in such a manner as to make possible an approach to within ten feet of a conductor.

(iii) When there is possibility of a winch line, cable, etc., either becoming disconnected or breaking under load because of excessive strain and flipping up into overhead conductors.

(iv) When placing steel, concrete reinforcement, wire mesh, etc.

(v) When handling pipe or rod sections in connection with digging wells or test holes.

(vi) When moving construction equipment, apparatus, machinery, etc., all such movements must avoid striking supporting structures, guy wires, or other elements of the electrical utility system causing the conductors to so swing or move as to decrease clearances to less than ten feet from construction equipment, or to cause them to come together.

(i) Warning sign required.

(ii) An approved durable warning sign legible at twelve feet, reading "It is unlawful to operate this equipment within ten feet of electrical conductors" shall be posted and maintained in plain view of the operator at the controls of each crane, derrick, shovel, drilling rig, pile driver or similar apparatus which is capable of vertical, lateral or swinging motion.

(iii) A similar sign shall be installed on the outside of the equipment and located as to be readily visible to mechanics or other persons engaged in the work operation.

(iv) Signs shall be not less than 6" x 8" dimensions with the word "WARNING" or "DANGER" in large letters and painted red across the top and the other letters in black painted on yellow background.

(v) Any overhead wire shall be considered to be an energized line until the owner of such line or the electrical utility authorities indicate that it is not an energized line and it has been visibly grounded.

(2) Passageways and open spaces.

(a) Barriers or other means of guarding shall be provided to ensure that workspace for electrical equipment will not be used as a passageway during periods when energized parts of electrical equipment are exposed.

(b) Working spaces, walkways, and similar locations shall be kept clear of cords so as not to create a tripping hazard to employees.

(3) Load ratings. In existing installations, no changes in circuit protection shall be made to increase the load in excess of the load rating of the circuit wiring.

(4) Fuses. When fuses are installed or removed with one or both terminals energized, special tools insulated for the voltage shall be used.

(5) Cords and cables.

(a) Worn or frayed electric cords or cables shall not be used.

(b) Extension cords shall not be fastened with staples, hung from nails, or suspended by wire.

[Statutory Authority: Chapter 49.17 RCW. 88-11-021 (Order 88-04), § 296-155-428, filed 5/11/88.]

[Title 296 WAC—p 1960]

#### WAC 296-155-429 Lockout and tagging of circuits.

(1) Controls. Controls that are deactivated during the course of work on energized or deenergized equipment or circuits shall be tagged and padlocked in the open position.

(2) Equipment and circuits. Equipment or circuits that are de-energized shall be rendered inoperative and have tags and locked padlocks attached at all points where such equipment or circuits can be energized.

(3) Tags. Tags shall be placed to identify plainly the equipment or circuits being worked on.

[Statutory Authority: Chapter 49.17 RCW. 88-11-021 (Order 88-04), § 296-155-429, filed 5/11/88.]

**WAC 296-155-432 Maintenance of equipment.** The employer shall ensure that all wiring components and utilization equipment in hazardous locations are maintained in a dust-tight, dust-ignition-proof, or explosion-proof condition, as appropriate. There shall be no loose or missing screws, gaskets, threaded connections, seals, or other impairments to a tight condition.

[Statutory Authority: Chapter 49.17 RCW. 88-11-021 (Order 88-04), § 296-155-432, filed 5/11/88.]

#### WAC 296-155-434 Environmental deterioration of equipment. (1) Deteriorating agents.

(a) Unless identified for use in the operating environment, no conductors or equipment shall be located:

(i) In damp or wet locations;

(ii) Where exposed to gases, fumes, vapors, liquids, or other agents having a deteriorating effect on the conductors or equipment; or

(iii) Where exposed to excessive temperatures.

(b) Control equipment, utilization equipment, and busways approved for use in dry locations only shall be protected against damage from the weather during building construction.

(2) Protection against corrosion. Metal raceways, cable armor, boxes, cable sheathing, cabinets, elbows, couplings, fittings, supports, and support hardware shall be of materials appropriate for the environment in which they are to be installed.

[Statutory Authority: Chapter 49.17 RCW. 88-11-021 (Order 88-04), § 296-155-434, filed 5/11/88.]

#### WAC 296-155-437 Batteries and battery charging.

(1) General requirements.

(a) Batteries of the unsealed type shall be located in enclosures with outside vents or in well ventilated rooms and shall be arranged so as to prevent the escape of fumes, gases, or electrolyte spray into other areas.

(b) Ventilation shall be provided to ensure diffusion of the gases from the battery and to prevent the accumulation of an explosive mixture.

(c) Racks and trays shall be substantial and shall be treated to make them resistant to the electrolyte.

(d) Floors shall be of acid resistant construction unless protected from acid accumulations.

(e) Face shields, aprons, and rubber gloves shall be provided for and worn by workers handling acids or batteries.

(f) Facilities for quick drenching of the eyes and body shall be provided within 25 feet (7.62 m) of battery handling areas.

(g) Facilities shall be provided for flushing and neutralizing spilled electrolyte and for fire protection.

(2) Charging.

(a) Battery charging installations shall be located in areas designated for that purpose.

(b) Charging apparatus shall be protected from damage by trucks.

(c) When batteries are being charged, the vent caps shall be kept in place to avoid electrolyte spray. Vent caps shall be maintained in functioning condition.

[Statutory Authority: Chapter 49.17 RCW. 88-11-021 (Order 88-04), § 296-155-437, filed 5/11/88.]

**WAC 296-155-441 Applicability.** (1) Covered. WAC 296-155-441 through 296-155-459 contain installation safety requirements for electrical equipment and installations used to provide electric power and light at the jobsite. These sections apply to installations, both temporary and permanent, used on the jobsite; but these sections do not apply to existing permanent installations that were in place before the construction activity commenced.

Note: If the electrical installation is made in accordance with the National Electrical Code ANSI/NFPA 70-1984, exclusive of formal interpretations and tentative interim amendments, it will be deemed to be in compliance with WAC 296-155-444 through 296-155-459, except for WAC 296-155-447 (2)(a) and 296-155-449 (1)(b)(ii)(E), (F), (G), and (J).

(2) Not covered. WAC 296-155-441 through 296-155-459 do not cover installations used for the generation, transmission, and distribution of electric energy, including related communication, metering, control, and transformation installations. (However, these regulations do cover portable and vehicle-mounted generators used to provide power for equipment used at the jobsite.) See chapter 296-44 WAC, Safety standards—Electrical Construction Code, for the construction of power distribution and transmission lines.

[Statutory Authority: Chapter 49.17 RCW. 88-11-021 (Order 88-04), § 296-155-441, filed 5/11/88.]

**WAC 296-155-444 General requirements.** (1) Approval. All electrical conductors and equipment shall be approved.

(2) Examination, installation, and use of equipment.

(a) Examination. The employer shall ensure that electrical equipment is free from recognized hazards that are likely to cause death or serious physical harm to employees. Safety of equipment shall be determined on the basis of the following considerations:

(i) Suitability for installation and use in conformity with the provisions of this part. Suitability of equipment for an identified purpose may be evidenced by listing, labeling, or certification for that identified purpose.

(ii) Mechanical strength and durability, including, for parts designed to enclose and protect other equipment, the adequacy of the protection thus provided.

(iii) Electrical insulation.

(iv) Heating effects under conditions of use.

(v) Arcing effects.

(vi) Classification by type, size, voltage, current capacity, specific use.

(vii) Other factors which contribute to the practical safeguarding of employees using or likely to come in contact with the equipment.

(b) Installation and use. Listed, labeled, or certified equipment shall be installed and used in accordance with instructions included in the listing, labeling, or certification.

(3) Interrupting rating. Equipment intended to break current shall have an interrupting rating at system voltage sufficient for the current that must be interrupted.

(4) Mounting and cooling of equipment.

(a) Mounting. Electric equipment shall be firmly secured to the surface on which it is mounted. Wooden plugs driven into holes in masonry, concrete, plaster, or similar materials shall not be used.

(b) Cooling. Electrical equipment which depends upon the natural circulation of air and convection principles for cooling of exposed surfaces shall be installed so that room air flow over such surfaces is not prevented by walls or by adjacent installed equipment. For equipment designed for floor mounting, clearance between top surfaces and adjacent surfaces shall be provided to dissipate rising warm air. Electrical equipment provided with ventilating openings shall be installed so that walls or other obstructions do not prevent the free circulation of air through the equipment.

(5) Splices. Conductors shall be spliced or joined with splicing devices designed for the use or by brazing, welding, or soldering with a fusible metal or alloy. Soldered splices shall first be so spliced or joined as to be mechanically and electrically secure without solder and then soldered. All splices and joints and the free ends of conductors shall be covered with an insulation equivalent to that of the conductors or with an insulating device designed for the purpose.

(6) Arcing parts. Parts of electric equipment which in ordinary operation produce arcs, sparks, flames, or molten metal shall be enclosed or separated and isolated from all combustible material.

(7) Marking. Electrical equipment shall not be used unless the manufacturer's name, trademark, or other descriptive marking by which the organization responsible for the product may be identified is placed on the equipment and unless other markings are provided giving voltage, current, wattage, or other ratings as necessary. The marking shall be of sufficient durability to withstand the environment involved.

(8) Identification of disconnecting means and circuits. Each disconnecting means required by this part for motors and appliances shall be legibly marked to indicate its purpose, unless located and arranged so the purpose is evident. Each service, feeder, and branch circuit, at its disconnecting means or overcurrent device, shall be legibly marked to indicate its purpose, unless located and arranged so the purpose is evident. These markings shall be of sufficient durability to withstand the environment involved.

(9) Construction site. Precautions shall be taken to make any necessary open wiring inaccessible to unauthorized personnel.

(10) 750 volts, nominal, or less. This subsection applies to equipment operating at 750 volts, nominal, or less.

(a) Working space about electric equipment. Sufficient access and working space shall be provided and maintained about all electric equipment to permit ready and safe operation and maintenance of such equipment.

(i) Working clearances. Except as required or permitted elsewhere in this part, the dimension of the working space in the direction of access to live parts operating at 750 volts or less and likely to require examination, adjustment, servicing, or maintenance while alive shall not be less than indicated in Table I-1. In addition to the dimensions shown in Table I-1, workspace shall not be less than 30 inches (762 mm) wide in front of the electric equipment. Distances shall be measured from the live parts if they are exposed, or from the enclosure front or opening if the live parts are enclosed. Walls constructed of concrete, brick, or tile are considered to be grounded. Working space is not required in back of assemblies such as dead-front switchboards or motor control centers where there are no renewable or adjustable parts such as fuses or switches on the back and where all connections are accessible from locations other than the back.

Table I-1  
Working Clearances

Nominal Voltage to Ground	Minimum Clear Distance for Conditions <sup>1</sup>		
	(a)	(b)	(c)
	Feet <sup>2</sup>	Feet <sup>2</sup>	Feet <sup>2</sup>
0-150.....	3	3	3
151-750.....	3	3 1/2	4

<sup>1</sup>Conditions (a), (b), and (c) are as follows: (a) Exposed live parts on one side and no live or grounded parts on the other side of the working space, or exposed live parts on both sides effectively guarded by insulating material. Insulated wire or insulated busbars operating at not over 300 volts are not considered live parts. (b) Exposed live parts on one side and grounded parts on the other side. (c) Exposed live parts on both sides of the workspace not guarded provided in condition (a) with the operator between.

<sup>2</sup>Note—For International System of Units (SI): One foot=0.3048m.

(ii) Clear spaces. Working space required by this part shall not be used for storage. When normally enclosed live parts are exposed for inspection or servicing, the working space, if in a passageway or general open space, shall be guarded.

(iii) Access and entrance to working space. At least one entrance shall be provided to give access to the working space about electric equipment.

(iv) Front working space. Where there are live parts normally exposed on the front of switchboards or motor

control centers, the working space in front of such equipment shall not be less than 3 feet (914 mm).

(v) Headroom. The minimum headroom of working spaces about service equipment, switchboards, panelboards, or motor control centers shall be 6 feet 3 inches (1.91 m).

(b) Guarding of live parts.

(i) Except as required or permitted elsewhere in this part, live parts of electric equipment operating at 50 volts or more shall be guarded against accidental contact by cabinets or other forms of enclosures, or by any of the following means:

(A) By location in a room, vault, or similar enclosure that is accessible only to qualified persons.

(B) By partitions or screens so arranged that only qualified persons will have access to the space within reach of the live parts. Any openings in such partitions or screens shall be so sized and located that persons are not likely to come into accidental contact with the live parts or to bring conducting objects into contact with them.

(C) By location on a balcony, gallery, or platform so elevated and arranged as to exclude unqualified persons.

(D) By elevation of 8 feet (2.44 m) or more above the floor or other working surface and so installed as to exclude unqualified persons.

(ii) In locations where electric equipment would be exposed to physical damage, enclosures or guards shall be so arranged and of such strength as to prevent such damage.

(iii) Entrances to rooms and other guarded locations containing exposed live parts shall be marked with conspicuous warning signs forbidding unqualified persons to enter.

(11) Over 750 volts, nominal.

(a) General. Conductors and equipment used on circuits exceeding 750 volts, nominal, shall comply with all applicable provisions of subsections (1) through (7) of this section and with the following provisions which supplement or modify those requirements. The provisions of (b), (c), and (d) of this subsection do not apply to equipment on the supply side of the service conductors.

(b) Enclosure for electrical installations. Electrical installations in a vault, room, closet or in an area surrounded by a wall, screen, or fence, access to which is controlled by lock and key or other equivalent means, are considered to be accessible to qualified persons only. A wall, screen, or fence less than 8 feet (2.44 m) in height is not considered adequate to prevent access unless it has other features that provide a degree of isolation equivalent to an 8 foot (2.44 m) fence. The entrances to all buildings, rooms or enclosures containing exposed live parts or exposed conductors operating at over 750 volts, nominal, shall be kept locked or shall be under the observation of a qualified person at all times.

(i) Installations accessible to qualified persons only. Electrical installations having exposed live parts shall be accessible to qualified persons only and shall comply with the applicable provisions of (c) of this subsection.



(ii) Installations accessible to unqualified persons. Electrical installations that are open to unqualified persons shall be made with metal-enclosed equipment or shall be enclosed in a vault or in an area, access to which is controlled by a lock. Metal-enclosed switchgear, unit substations, transformers, pull boxes, connection boxes, and other similar associated equipment shall be marked with appropriate caution signs. If equipment is exposed to physical damage from vehicular traffic, guards shall be provided to prevent such damage. Ventilating or similar openings in metal-enclosed equipment shall be designed so that foreign objects inserted through these openings will be deflected from energized parts.

(c) Workspace about equipment. Sufficient space shall be provided and maintained about electric equipment to permit ready and safe operation and maintenance of such equipment. Where energized parts are exposed, the minimum clear workspace shall not be less than 6 feet 6 inches (1.98 m) high (measured vertically from the floor or platform,) or less than 3 feet (914 mm) wide (measured parallel to the equipment.) The depth shall be as required in Table I-2. The workspace shall be adequate to permit at least a ninety degree opening of doors or hinged panels.

(i) Working space. The minimum clear working space in front of electric equipment such as switchboards, control panels, switches, circuit breakers, motor controllers, relays, and similar equipment shall not be less than specified in Table I-2 unless otherwise specified in this part. Distances shall be measured from the live parts if they are exposed, or from the enclosure front or opening if the live parts are enclosed. However, working space is not required in back of equipment such as deadfront switchboards or control assemblies where there are no renewable or adjustable parts (such as fuses or switches) on the back and where all connections are accessible from locations other than the back. Where rear access is required to work on de-energized parts on the back of enclosed equipment, a minimum working space of 30 inches (762 mm) horizontally shall be provided.

Table I-2  
Minimum Depth of Clear Working Space in Front of Electric Equipment

Nominal Voltage to Ground	Minimum Clear Distance for Conditions <sup>1</sup>		
	(a)	(b)	(c)
	Feet <sup>2</sup>	Feet <sup>2</sup>	Feet <sup>2</sup>
751 to 2,500	3	4	5
2,501 to 9,000	4	5	6
9,001 to 25,000	5	6	9
25,001 to 75kV	6	8	10
Above 75kV	8	10	12

<sup>1</sup>Conditions (a), (b), and (c) are as follows: (a) Exposed live parts on one side and no live or grounded parts on the other side of the working space, or exposed live parts on both sides effectively guarded by insulating materials. Insulated wire or insulated busbars operating at not

over 300 volts are not considered live parts. (b) Exposed live parts on one side and grounded parts on the other side. Walls constructed of concrete, brick, or the tile are considered to be grounded surfaces. (c) Exposed live parts on both sides of the workspace (not guarded as provided in Condition (a)) with the operator between.

<sup>2</sup>Note-For S1 units: One foot=0.3048m.

(ii) Lighting outlets and points of control. The lighting outlets shall be so arranged that persons changing lamps or making repairs on the lighting system will not be endangered by live parts or other equipment. The points of control shall be so located that persons are not likely to come in contact with any live part or moving part of the equipment while turning on the lights.

(iii) Elevation of unguarded live parts. Unguarded live parts above working space shall be maintained at elevations not less than specified in Table I-3.

Table I-3  
Elevation of Unguarded Energized Parts Above Working Space

Nominal Voltage to Between Phases	Minimum Elevation
751, 7,500	8 feet 6 inches <sup>1</sup>
7,501 to 35,000	9 feet
Over 35kV	9 feet + 0.37 inches per kV above 35kV

<sup>1</sup> Note-For S1 units: One inch=25.4mm, one foot=0.3048m.

(d) Entrance and access to workspace. At least one entrance not less than 24 inches (610 mm) wide and 6 feet 6 inches (1.98 m) high shall be provided to give access to the working space about electric equipment. On switchboard and control panels exceeding 48 inches (1.22 m) in width, there shall be one entrance at each end of such board where practicable. Where bare energized parts at any voltage or insulated energized parts above 750 volts are located adjacent to such entrance, they shall be guarded.

(12) Welding and cutting equipment. Welding and cutting equipment shall meet the requirements specified in Parts D and H of this chapter.

[Statutory Authority: Chapter 49.17 RCW. 88-11-021 (Order 88-04), § 296-155-444 filed 5/11/88.]

**WAC 296-155-447 Wiring design and protection.**  
(1) Use and identification of grounded and grounding conductors.

(a) Identification of conductors. A conductor used as a grounded conductor shall be identifiable and distinguishable from all other conductors. A conductor used as an equipment grounding conductor shall be identifiable and distinguishable from all other conductors.

(b) Polarity of connections. No grounded conductor shall be attached to any terminal or lead so as to reverse designated polarity.

(c) Use of grounding terminals and devices. A grounding terminal or grounding-type device on a receptacle, cord connector, or attachment plug shall not be used for purposes other than grounding.



(2) Branch circuits.

(a) Ground-fault protection.

(i) General. The employer shall use either ground-fault circuit interrupters as specified in (a)(ii) of this subsection or an assured equipment grounding conductor program as specified in (a)(iii) of this subsection to protect employees on construction sites. These requirements are in addition to any other requirements for equipment grounding conductors.

(ii) Ground-fault circuit interrupters. All 120-volt, single-phase, 15-ampere and 20-ampere receptacle outlets on construction sites, which are not a part of the permanent wiring of the building or structure and which are in use by employees, shall have approved ground-fault circuit interrupters for personnel protection. Receptacles on a two-wire, single-phase portable or vehicle-mounted generator rated not more than 5kW, where the circuit conductors of the generator are insulated from the generator frame and all other grounded surfaces, need not be protected with ground-fault circuit interrupters.

(iii) Assured equipment grounding conductor program. The employer shall establish and implement an assured equipment grounding conductor program on construction sites covering all cord sets, receptacles which are not a part of the building or structure, and equipment connected by cord and plug which are available for use or used by employees. This program shall comply with the following minimum requirements:

(A) A written description of the program, including the specific procedures adopted by the employer, shall be available at the jobsite for inspection and copying by the director and any affected employee.

(B) The employer shall designate one or more competent persons (as defined in WAC 296-155-012(4)) to implement the program, and to perform continuing tests and inspections as required.

(C) Each cord set, attachment cap, plug and receptacle of cord sets, and any equipment connected by cord and plug, except cord sets and receptacles which are fixed and not exposed to damage, shall be visually inspected before each day's use for external defects, such as deformed or missing pins or insulation damage, and for indications of possible internal damage. Equipment found damaged or defective shall not be used until repaired.

(D) The following tests shall be performed on all cord sets, receptacles which are not a part of the permanent wiring of the building or structure, and cord-connected and plug-connected equipment required to be grounded:

(I) All equipment grounding conductors shall be tested for continuity and shall be electrically continuous.

(II) Each receptacle and attachment cap or plug shall be tested for correct attachment of the equipment grounding conductor. The equipment grounding conductor shall be connected to its proper terminal.

(III) Each outlet receptacle, or power source shall be tested to ensure proper polarity.

(E) All required tests shall be performed:

(I) Before first use;

(II) Before equipment is returned to service following any repairs;

(III) Before equipment is used after any incident which can be reasonably suspected to have caused damage (for example, when a cord set is run over); and

(IV) At intervals not to exceed 3 months, except that cord sets and receptacles which are fixed and not exposed to damage shall be tested at intervals not exceeding 6 months.

(F) The employer shall not make available or permit the use by employees of any equipment which has not met the requirements of (a)(iii) of this subsection.

(G) Tests performed as required in this subsection shall be recorded. This test record shall identify each receptacle, cord set, and cord-connected and plug-connected equipment that passed the test and shall indicate the last date it was tested or the interval for which it was tested. This record shall be kept by means of logs, color coding, or other effective means and shall be maintained until replaced by a more current record. The record shall be made available on the jobsite for inspection by the director and any affected employee.

(b) Outlet devices. Outlet devices shall have an ampere rating not less than the load to be served and shall comply with the following:

(i) Single receptacles. A single receptacle installed on an individual branch circuit shall have an ampere rating of not less than that of the branch circuit.

(ii) Two or more receptacles. Where connected to a branch circuit supplying two or more receptacles or outlets, receptacle ratings shall conform to the values listed in Table I-4.

(iii) Receptacles used for the connection of motors. The rating of an attachment plug or receptacle used for cord-connection and plug-connection of a motor to a branch circuit shall not exceed 15 amperes at 125 volts or 10 amperes at 250 volts if individual overload protection is omitted.

Table I-4  
Receptacle Ratings for Various Size Circuits

Circuit Rating Amperes	Receptacle Rating Amperes
15	Not Over 15
20	15 or 20
30	30
40	40 or 50
50	50

(3) Outside conductors and lamps.

(a) 750 volts, nominal, or less. (a)(i) through (iv)(D) of this subsection apply to branch circuit, feeder, and service conductors rated 750 volts, nominal, or less and run outdoors as open conductors.

(i) Conductors on poles. Conductors supported on poles shall provide a horizontal climbing space not less than the following:

(A) Power conductors below communication conductors: 30 inches (762 mm).

(B) Power conductors alone or above communication conductors: 300 volts or less—24 inches (610 mm); more than 300 volts—30 inches (762 mm).

(C) Communication conductors below power conductors: With power conductors 300 volts or less—24 inches (610 mm); more than 300 volts—30 inches (762 mm).

(ii) Clearance from ground. Open conductors shall conform to the following minimum clearances:

(A) 10 feet (3.05 m)—above finished grade, sidewalks, or from any platform or projection from which they might be reached.

(B) 12 feet (3.66 m)—over areas subject to vehicular traffic other than truck traffic.

(C) 15 feet (4.57 m)—over areas other than those specified in (a)(ii)(D) of this subsection that are subject to truck traffic.

(D) 18 feet (5.49 m)—over public streets, alleys, roads, and driveways.

(iii) Clearance from building openings. Conductors shall have a clearance of at least 3 feet (914 mm) from windows, doors, fire escapes, or similar locations. Conductors run above the top level of a window are considered to be out of reach from that window and, therefore, do not have to be 3 feet (914 mm) away.

(iv) Clearance over roofs. Conductors above roof space accessible to employees on foot shall have a clearance from the highest point of the roof surface of not less than 8 feet (2.44 m) vertical clearance for insulated conductors, not less than 10 feet (3.05 m) vertical or diagonal clearance for covered conductors, and not less than 15 feet (4.57 m) for bare conductors, except that:

(A) Where the roof space is also accessible to vehicular traffic, the vertical clearance shall not be less than 18 feet (5.49 m); or

(B) Where the roof space is not normally accessible to employees on foot, fully insulated conductors shall have a vertical or diagonal clearance of not less than 3 feet (914 mm); or

(C) Where the voltage between conductors is 300 volts or less and the roof has a slope of not less than 4 inches (102 mm) in 12 inches (305 mm), the clearance from roofs shall be at least 3 feet (914 mm); or

(D) Where the voltage between conductors is 300 volts or less and the conductors do not pass over more than 4 feet (1.22 m) of the overhang portion of the roof and they are terminated at a through-the-roof raceway or support, the clearance from roofs shall be at least 18 inches (457 mm).

(b) Location of outdoor lamps. Lamps for outdoor lighting shall be located below all live conductors, transformers, or other electric equipment, unless such equipment is controlled by a disconnecting means that can be locked in the open position or unless adequate clearances or other safeguards are provided for relamping operations.

(4) Services.

(a) Disconnecting means.

(i) General. Means shall be provided to disconnect all conductors in a building or other structure from the service-entrance conductors. The disconnecting means shall plainly indicate whether it is in the open or closed position and shall be installed at a readily accessible location nearest the point of entrance of the service-entrance conductors.

(ii) Simultaneous opening of poles. Each service disconnecting means shall simultaneously disconnect all ungrounded conductors.

(b) Services over 750 volts, nominal. The following additional requirements apply to services over 750 volts, nominal.

(i) Guarding. Service-entrance conductors installed as open wires shall be guarded to make them accessible only to qualified persons.

(ii) Warning signs. Signs warning of high voltage shall be posted where unauthorized employees might come in contact with live parts.

(5) Overcurrent protection.

(a) 750 volts, nominal, or less. The following requirements apply to overcurrent protection of circuits rated 750 volts, nominal, or less.

(i) Protection of conductors and equipment. Conductors and equipment shall be protected from overcurrent in accordance with their ability to safely conduct current. Conductors shall have sufficient ampacity to carry the load.

(ii) Grounded conductors. Except for motor-running overload protection, overcurrent devices shall not interrupt the continuity of the grounded conductor unless all conductors of the circuit are opened simultaneously.

(iii) Disconnection of fuses and thermal cutouts. Except for devices provided for current-limiting on the supply side of the service disconnecting means, all cartridge fuses which are accessible to other than qualified persons and all fuses and thermal cutouts on circuits over 150 volts to ground shall be provided with disconnecting means. This disconnecting means shall be installed so that the fuse or thermal cutout can be disconnected from its supply without disrupting service to equipment and circuits unrelated to those protected by the overcurrent device.

(iv) Location in or on premises. Overcurrent devices shall be readily accessible. Overcurrent devices shall not be located where they could create an employee safety hazard by being exposed to physical damage or located in the vicinity of easily ignitable material.

(v) Arcing or suddenly moving parts. Fuses and circuit breakers shall be so located or shielded that employees will not be burned or otherwise injured by their operation.

(vi) Circuit breakers.

(A) Circuit breakers shall clearly indicate whether they are in the open (off) or closed (on) position.

(B) Where circuit breaker handles on switchboards are operated vertically rather than horizontally or rotationally, the up position of the handle shall be the closed (on) position.

(C) If used as switches in 120-volt, fluorescent lighting circuits, circuit breakers shall be marked "SWD."

(b) Over 750 volts, nominal. Feeders and branch circuits over 750 volts, nominal, shall have short-circuit protection.

(6) Effective grounding. The path from circuits, equipment, structures, and conduit or enclosures to ground shall be permanent and continuous; have ample carrying capacity to conduct safely the currents liable to be imposed on it; and have the impedance sufficiently low to limit the potential above ground and to result in the operation of the overcurrent devices in the circuit. (a) through (k) of this subsection contain grounding requirements for systems, circuits, and equipment.

(a) Systems to be grounded. The following systems which supply premises wiring shall be grounded:

(i) Three-wire DC systems. All three-wire DC systems shall have their neutral conductor grounded.

(ii) Two-wire DC systems. Two-wire DC systems operating at over 50 volts through 300 volts between conductors shall be grounded unless they are rectifier-derived from an AC system complying with (a)(iii), (iv), and (v) of this subsection.

(iii) AC circuits, less than 50 volts. AC circuits of less than 50 volts shall be grounded if they are installed as overhead conductors outside of buildings or if they are supplied by transformers and the transformer primary supply system is ungrounded or exceeds 150 volts to ground.

(iv) AC systems, 50 volts to 1000 volts. AC systems of 50 volts to 1000 volts shall be grounded under any of the following conditions, unless exempted by (a)(v) of this subsection:

(A) If the system can be so grounded that the maximum voltage to ground on the ungrounded conductors does not exceed 150 volts;

(B) If the system is nominally rated 480Y/277 volt, 3-phase, 4-wire in which the neutral is used as a circuit conductor;

(C) If the system is nominally rated 240/120 volt, 3-phase, 4-wire in which the midpoint of one phase is used as a circuit conductor; or

(D) If a service conductor is uninsulated.

(v) Exceptions. AC systems of 50 volts to 1000 volts are not required to be grounded if the system is separately derived and is supplied by a transformer that has a primary voltage rating less than 1000 volts, provided all of the following conditions are met:

(A) The system is used exclusively for control circuits;

(B) The conditions of maintenance and supervision assure that only qualified persons will service the installation;

(C) Continuity of control power is required; and

(D) Ground detectors are installed on the control system.

(b) Separately derived systems. Where (a) of this subsection requires grounding of wiring systems whose power is derived from generator, transformer, or converter windings and has no direct electrical connection, including a solidly connected grounded circuit conductor, to supply conductors originating in another system, (e) of this subsection shall also apply.

(c) Portable and vehicle-mounted generators.

(i) Portable generators. Under the following conditions, the frame of a portable generator need not be grounded and may serve as the grounding electrode for a system supplied by the generator:

(A) The generator supplies only equipment mounted on the generator and/or cord-connected and plug-connected equipment through receptacles mounted on the generator; and

(B) The noncurrent-carrying metal parts of equipment and the equipment grounding conductor terminals of the receptacles are bonded to the generator frame.

(ii) Vehicle-mounted generators. Under the following conditions the frame of a vehicle may serve as the grounding electrode for a system supplied by a generator located on the vehicle:

(A) The frame of the generator is bonded to the vehicle frame; and

(B) The generator supplies only equipment located on the vehicle and/or cord-connected and plug-connected equipment through receptacles mounted on the vehicle or on the generator; and

(C) The noncurrent-carrying metal parts of equipment and the equipment grounding conductor terminals of the receptacles are bonded to the generator frame; and

(D) The system complies with all other provisions of this section.

(iii) Neutral conductor bonding. A neutral conductor shall be bonded to the generator frame if the generator is a component of a separately derived system. No other conductor need be bonded to the generator frame.

(d) Conductors to be grounded. For AC premises wiring systems the identified conductor shall be grounded.

(e) Grounding connections.

(i) Grounded system. For a grounded system, a grounding electrode conductor shall be used to connect both the equipment grounding conductor and the grounded circuit conductor to the grounding electrode. Both the equipment grounding conductor and the grounding electrode conductor shall be connected to the grounded circuit conductor on the supply side of the service disconnecting means, or on the supply side of the system disconnecting means or overcurrent devices if the system is separately derived.

(ii) Ungrounded systems. For an ungrounded service-supplied system, the equipment grounding conductor shall be connected to the grounding electrode conductor at the service equipment. For an ungrounded separately derived system, the equipment grounding conductor shall be connected to the grounding electrode conductor at, or ahead of, the system disconnecting means or overcurrent devices.

(f) Grounding path. The path to ground from circuits, equipment, and enclosures shall be permanent and continuous.

(g) Supports, enclosures, and equipment to be grounded.

(i) Supports and enclosures for conductors. Metal cable trays, metal raceways, and metal enclosures for conductors shall be grounded, except that:

(A) Metal enclosures such as sleeves that are used to protect cable assemblies from physical damage need not be grounded; and

(B) Metal enclosures for conductors added to existing installations of open wire, knob-and-tube wiring, and nonmetallic-sheathed cable need not be grounded if all of the following conditions are met:

(I) Runs are less than 25 feet (7.62 m);

(II) Enclosures are free from probable contact with ground, grounded metal, metal laths, or other conductive materials; and

(III) Enclosures are guarded against employee contact.

(ii) Service equipment enclosures. Metal enclosures for service equipment shall be grounded.

(iii) Fixed equipment. Exposed noncurrent-carrying metal parts of fixed equipment which may become energized shall be grounded under any of the following conditions:

(A) If within 8 feet (2.44 m) vertically or 5 feet (1.52 m) horizontally of ground or grounded metal objects and subject to employee contact.

(B) If located in a wet or damp location and subject to employee contact.

(C) If in electrical contact with metal.

(D) If in a hazardous (classified) location.

(E) If supplied by a metal-clad, metal-sheathed, or grounded metal raceway wiring method.

(F) If equipment operates with any terminal at over 150 volts to ground; however, the following need not be grounded:

(I) Enclosures for switches or circuit breakers used for other than service equipment and accessible to qualified persons only;

(II) Metal frames of electrically heated appliances which are permanently and effectively insulated from ground; and

(III) The cases of distribution apparatus such as transformers and capacitors mounted on wooden poles at a height exceeding 8 feet (2.44 m) above ground or grade level.

(iv) Equipment connected by cord and plug. Under any of the conditions described in (g)(iv)(A) through (C) of this subsection, exposed noncurrent-carrying metal parts of cord-connected and plug-connected equipment which may become energized shall be grounded:

(A) If in a hazardous (classified) location (see WAC 296-155-444).

(B) If operated at over 150 volts to ground, except for guarded motors and metal frames of electrically heated appliances if the appliance frames are permanently and effectively insulated from ground.

(C) If the equipment is one of the types listed in (g)(iv)(C)(I) through (V) of this subsection. However, even though the equipment may be one of these types, it need not be grounded if it is exempted by (g)(iv)(C)(VI) of this subsection.

(I) Hand held motor-operated tools;

(II) Cord-connected and plug-connected equipment used in damp or wet locations or by employees standing

on the ground or on metal floors or working inside of metal tanks or boilers;

(III) Portable and mobile x-ray and associated equipment;

(IV) Tools likely to be used in wet and/or conductive locations; and

(V) Portable hand lamps.

(VI) Tools likely to be used in wet and/or conductive locations need not be grounded if supplied through an isolating transformer with an ungrounded secondary of not over 50 volts. Listed or labeled portable tools and appliances protected by a system of double insulation, or its equivalent, need not be grounded. If such a system is employed, the equipment shall be distinctively marked to indicate that the tool or appliance utilizes a system of double insulation.

(v) Nonelectrical equipment. The metal parts of the following nonelectrical equipment shall be grounded: Frames and tracks of electrically operated cranes; frames of nonelectrically driven elevator cars to which electric conductors are attached; hand-operated metal shifting ropes or cables of electric elevators, and metal partitions, grill work, and similar metal enclosures around equipment of over 1kV between conductors.

(h) Methods of grounding equipment.

(i) With circuit conductors. Noncurrent-carrying metal parts of fixed equipment, if required to be grounded by this part, shall be grounded by an equipment grounding conductor which is contained within the same raceway, cable, or cord, or runs with or encloses the circuit conductors. For DC circuits only, the equipment grounding conductor may be run separately from the circuit conductors.

(ii) Grounding conductor. A conductor used for grounding fixed or movable equipment shall have capacity to conduct safely any fault current which may be imposed on it.

(iii) Equipment considered effectively grounded. Electric equipment is considered to be effectively grounded if it is secured to, and in electrical contact with, a metal rack or structure that is provided for its support and the metal rack or structure is grounded by the method specified for the noncurrent-carrying metal parts of fixed equipment in (h)(i) of this subsection. Metal car frames supported by metal hoisting cables attached to or running over metal sheaves or drums of grounded elevator machines are also considered to be effectively grounded.

(i) Bonding.

(i) If bonding conductors are used to assure electrical continuity, they shall have the capacity to conduct any fault current which may be imposed.

(ii) When attaching bonding and grounding clamps or clips, a secure and positive metal-to-metal contact shall be made. Such attachments shall be made before closures are opened and material movements are started and shall not be broken until after material movements are stopped and closures are made.

(j) Made electrodes. If made electrodes are used, they shall be free from nonconductive coatings, such as paint or enamel; and, if practicable, they shall be embedded

below permanent moisture level. A single electrode consisting of a rod, pipe or plate which has a resistance to ground greater than 25 ohms shall be augmented by one additional electrode installed no closer than 6 feet (1.83 m) to the first electrode.

(k) Grounding of systems and circuits of 1000 volts and over (high voltage).

(i) General. If high voltage systems are grounded, they shall comply with all applicable provisions of (a) through (j) of this subsection as supplemented and modified by (k) of this subsection.

(ii) Grounding of systems supplying portable or mobile equipment. Systems supplying portable or mobile high voltage equipment, other than substations installed on a temporary basis, shall comply with the following:

(A) Portable and mobile high voltage equipment shall be supplied from a system having its neutral grounded through an impedance. If a delta-connected high voltage system is used to supply the equipment, a system neutral shall be derived.

(B) Exposed noncurrent-carrying metal parts of portable and mobile equipment shall be connected by an equipment grounding conductor to the point at which the system neutral impedance is grounded.

(C) Ground-fault detection and relaying shall be provided to automatically deenergize any high voltage system component which has developed a ground fault. The continuity of the equipment grounding conductor shall be continuously monitored so as to de-energize automatically the high voltage feeder to the portable equipment upon loss of continuity of the equipment grounding conductor.

(D) The grounding electrode to which the portable or mobile equipment system neutral impedance is connected shall be isolated from and separated in the ground by at least 20 feet (6.1 m) from any other system or equipment grounding electrode, and there shall be no direct connection between the grounding electrodes, such as buried pipe, fence or like objects.

(iii) Grounding of equipment. All noncurrent-carrying metal parts of portable equipment and fixed equipment including their associated fences, housings, enclosures, and supporting structures shall be grounded. However, equipment which is guarded by location and isolated from ground need not be grounded. Additionally, pole-mounted distribution apparatus at a height exceeding 8 feet (2.44 m) above ground or grade level need not be grounded.

[Statutory Authority: Chapter 49.17 RCW. 88-11-021 (Order 88-04), § 296-155-447 filed 5/11/88.]

**WAC 296-155-449 Wiring methods, components, and equipment for general use.** (1) Wiring methods. The provisions of this subsection do not apply to conductors which form an integral part of equipment such as motors, controllers, motor control centers and like equipment.

(a) General requirements.

(i) Electrical continuity of metal raceways and enclosures. Metal raceways, cable armor, and other metal

enclosures for conductors shall be metallically joined together into a continuous electric conductor and shall be so connected to all boxes, fittings, and cabinets as to provide effective electrical continuity.

(ii) Wiring in ducts. No wiring systems of any type shall be installed in ducts used to transport dust, loose stock or flammable vapors. No wiring system of any type shall be installed in any duct used for vapor removal or in any shaft containing only such ducts.

(iii) Receptacles for attachment plugs shall be approved, concealed contact type with a contact for extending ground continuity and shall be so designed and constructed that the plug may be pulled out without leaving any live parts exposed to accidental contact. All temporary outlet boxes shall be of a type suitable for use in wet or damp locations.

(iv) Attachment plugs or other connectors supplying equipment at more than 300 volts shall be of the skirted type or otherwise so designed that arcs will be confined.

(b) Temporary wiring.

(i) Scope. The provisions of (b) of this subsection apply to temporary electrical power and lighting wiring methods which may be of a class less than would be required for a permanent installation. Except as specifically modified in (b) of this subsection, all other requirements of this part for permanent wiring shall apply to temporary wiring installations. Temporary wiring shall be removed immediately upon completion of construction or the purpose for which the wiring was installed.

(ii) General requirements for temporary wiring.

(A) Feeders shall originate in a distribution center. The conductors shall be run as multiconductor cord or cable assemblies or within raceways; or, where not subject to physical damage, they may be run as open conductors on insulators not more than 10 feet (3.05 m) apart.

(B) Branch circuits shall originate in a power outlet or panelboard. Conductors shall be run as multiconductor cord or cable assemblies or open conductors, or shall be run in raceways. All conductors shall be protected by overcurrent devices at their ampacity. Runs of open conductors shall be located where the conductors will not be subject to physical damage, and the conductors shall be fastened at intervals not exceeding 10 feet (3.05 m). No branch-circuit conductors shall be laid on the floor. Each branch circuit that supplies receptacles or fixed equipment shall contain a separate equipment grounding conductor if the branch circuit is run as open conductors.

(C) Receptacles shall be of the grounding type. Unless installed in a complete metallic raceway, each branch circuit shall contain a separate equipment grounding conductor, and all receptacles shall be electrically connected to the grounding conductor. Receptacles for uses other than temporary lighting shall not be installed on branch circuits which supply temporary lighting. Receptacles shall not be connected to the same ungrounded conductor of multiwire circuits which supply temporary lighting.

(D) Disconnecting switches or plug connectors shall be installed to permit the disconnection of all ungrounded conductors of each temporary circuit.

(E) Temporary lights shall be protected by guards of a nonconductive or insulated material to prevent accidental contact with the bulb, except that guards are not required when the construction of the reflector is such that the bulb is deeply recessed.

(F) Temporary lights shall be equipped with hard usage (S or SJ types) electric cords with connections and insulation maintained in safe condition. "Brewery" cord (type CBO or NB) may be substituted for hard usage cord provided it is protected from physical damages. Temporary lights shall not be suspended by their electric cords unless cords and lights are designed for this means of suspension. Splices shall retain the insulation, outer sheath properties, flexibility, and usage characteristics of the cord being spliced.

When pin-type connectors or lampholders are utilized, the area of perforations caused by lampholder removal shall be restored to the insulation capabilities of the cord.

(G) Portable electric lighting used in wet and/or other conductive locations, as for example, drums, tanks, and vessels, shall be operated at 12 volts or less. However, 120-volt lights may be used if protected by a ground-fault circuit interrupter.

(H) A box shall be used wherever a change is made to a raceway system or a cable system which is metal clad or metal sheathed.

(I) Flexible cords and cables shall be protected from damage. Sharp corners and projections shall be avoided. Flexible cords and cables may pass through doorways or other pinch points, if protection is provided to avoid damage.

(J) Extension cord sets used with portable electric tools and appliances shall be of three-wire type and shall be designed for hard or extra-hard usage. Flexible cords used with temporary and portable lights shall be designed for hard or extra-hard usage.

Note: The National Electrical Code, ANSI/NFPA 70, in Article 400, Table 400-4, lists various types of flexible cords, some of which are noted as being designed for hard or extra-hard usage. Examples of these types of flexible cords include hard service cord (types S, ST, SO, STO) and junior hard service cord (types SJ, SJO, SJT, SJTO).

(iii) Guarding. For temporary wiring over 750 volts, nominal, fencing, barriers, or other effective means shall be provided to prevent access of other than authorized and qualified personnel.

#### (2) Cabinets, boxes, and fittings.

(a) Conductors entering boxes, cabinets, or fittings. Conductors entering boxes, cabinets, or fittings shall be protected from abrasion, and openings through which conductors enter shall be effectively closed. Unused openings in cabinets, boxes, and fittings shall also be effectively closed.

(b) Covers and canopies. All pull boxes, junction boxes, and fittings shall be provided with covers. If metal covers are used, they shall be grounded. In energized installations each outlet box shall have a cover,

faceplate, or fixture canopy. Covers of outlet boxes having holes through which flexible cord pendants pass shall be provided with bushings designed for the purpose or shall have smooth, well-rounded surfaces on which the cords may bear.

(c) Pull and junction boxes for systems over 750 volts, nominal. In addition to other requirements in this section for pull and junction boxes, the following shall apply to these boxes for systems over 750 volts, nominal:

(i) Complete enclosure. Boxes shall provide a complete enclosure for the contained conductors or cables.

(ii) Covers. Boxes shall be closed by covers securely fastened in place. Underground box covers that weigh over 100 pounds (43.6 kg) meet this requirement. Covers for boxes shall be permanently marked "HIGH VOLTAGE." The marking shall be on the outside of the box cover and shall be readily visible and legible.

(3) Knife switches. Single-throw knife switches shall be so connected that the blades are dead when the switch is in the open position. Single-throw knife switches shall be so placed that gravity will not tend to close them. Single-throw knife switches approved for use in the inverted position shall be provided with a locking device that will ensure that the blades remain in the open position when so set. Double-throw knife switches may be mounted so that the throw will be either vertical or horizontal. However, if the throw is vertical, a locking device shall be provided to ensure that the blades remain in the open position when so set.

(4) Switchboards and panelboards. Switchboards that have any exposed live parts shall be located in permanently dry locations and accessible only to qualified persons. Panelboards shall be mounted in cabinets, cutout boxes, or enclosures designed for the purpose and shall be dead front. However, panelboards other than the dead front externally-operable type are permitted where accessible only to qualified persons. Exposed blades of knife switches shall be dead when open.

(5) Enclosures for damp or wet locations.

(a) Cabinets, fittings, and boxes. Cabinets, cutout boxes, fittings, boxes, and panelboard enclosures in damp or wet locations shall be installed so as to prevent moisture or water from entering and accumulating within the enclosures. In wet locations the enclosures shall be weatherproof.

(b) Switches and circuit breakers. Switches, circuit breakers, and switchboards installed in wet locations shall be enclosed in weatherproof enclosures.

(6) Conductors for general wiring. All conductors used for general wiring shall be insulated unless otherwise permitted in this part. The conductor insulation shall be of a type that is suitable for the voltage, operating temperature, and location of use. Insulated conductors shall be distinguishable by appropriate color or other means as being grounded conductors, ungrounded conductors, or equipment grounding conductors.

(7) Flexible cords and cables.

(a) Use of flexible cords and cables.

(i) Permitted uses. Flexible cords and cables shall be suitable for conditions of use and location. Flexible cords and cables shall be used only for:



- (A) Pendants;
- (B) Wiring of fixtures;
- (C) Connection of portable lamps or appliances;
- (D) Elevator cables;
- (E) Wiring of cranes and hoists;
- (F) Connection of stationary equipment to facilitate their frequent interchange;

(G) Prevention of the transmission of noise or vibration; or

(H) Appliances where the fastening means and mechanical connections are designed to permit removal for maintenance and repair.

(ii) Attachment plugs for cords. If used as permitted in (a)(i)(C), (F), or (H) of this subsection, the flexible cord shall be equipped with an attachment plug and shall be energized from a receptacle outlet.

(iii) Prohibited uses. Unless necessary for a use permitted in (a)(i) of this subsection, flexible cords and cables shall not be used:

- (A) As a substitute for the fixed wiring of a structure;
- (B) Where run through holes in walls, ceilings, or floors;

(C) Where run through doorways, windows, or similar openings, except as permitted in subsection (1)(b)(ii)(I) of this section;

- (D) Where attached to building surfaces; or
- (E) Where concealed behind building walls, ceilings, or floors.

(b) Identification, splices, and terminations.

(i) Identification. A conductor of a flexible cord or cable that is used as a grounded conductor or an equipment grounding conductor shall be distinguishable from other conductors.

(ii) Marking. Type SJ, SJO, SJT, SJTO, S, SO, ST, and STO cords shall not be used unless durably marked on the surface with the type designation, size, and number of conductors.

(iii) Splices. Flexible cords shall be used only in continuous lengths without splice or tap. Hard service flexible cords No. 12 or larger may be repaired if spliced so that the splice retains the insulation, outer sheath properties, and usage characteristics of the cord being spliced.

(iv) Strain relief. Flexible cords shall be connected to devices and fittings so that strain relief is provided which will prevent pull from being directly transmitted to joints or terminal screws.

(v) Cords passing through holes. Flexible cords and cables shall be protected by bushings or fittings where passing through holes in covers, outlet boxes, or similar enclosures.

(vi) Trailing cables shall be protected from damage.

(vii) Cord and cable passing through work areas shall be covered or elevated to protect it from damage which would create a hazard to employees.

(8) Portable cables over 750 volts, nominal. Multiconductor portable cable for use in supplying power to portable or mobile equipment at over 750 volts, nominal, shall consist of No. 8 or larger conductors employing flexible stranding. Cables operated at over 2000 volts shall be shielded for the purpose of confining the

voltage stresses to the insulation. Grounding conductors shall be provided. Connectors for these cables shall be of a locking type with provisions to prevent their opening or closing while energized. Strain relief shall be provided at connections and terminations. Portable cables shall not be operated with splices unless the splices are of the permanent molded, vulcanized, or other equivalent type. Termination enclosures shall be marked with a high voltage hazard warning, and terminations shall be accessible only to authorized and qualified personnel.

(9) Fixture wires.

(a) General. Fixture wires shall be suitable for the voltage, temperature, and location of use. A fixture wire which is used as a grounded conductor shall be identified.

(b) Uses permitted. Fixture wires may be used:

(i) For installation in lighting, fixtures and in similar equipment where enclosed or protected and not subject to bending or twisting in use; or

(ii) For connecting lighting fixtures to the branch-circuit conductors supplying the fixtures.

(c) Uses not permitted. Fixture wires shall not be used as branch-circuit conductors except as permitted for Class 1 power-limited circuits.

(10) Equipment for general use.

(a) Lighting fixtures, lampholders, lamps, and receptacles.

(i) Live parts. Fixtures, lampholders, lamps, rosettes, and receptacles shall have no live parts normally exposed to employee contact. However, rosettes and cleat-type lampholders and receptacles located at least 8 feet (2.44 m) above the floor may have exposed parts.

(ii) Support. Fixtures, lampholders, rosettes, and receptacles shall be securely supported. A fixture that weighs more than 6 pounds (2.72 kg) or exceeds 16 inches (406 mm) in any dimension shall not be supported by the screw shell of a lampholder.

(iii) Portable lamps. Portable lamps shall be wired with flexible cord and an attachment plug of the polarized or grounding type. If the portable lamp uses an Edison-based lampholder, the grounded conductor shall be identified and attached to the screw shell and the identified blade of the attachment plug. In addition, portable handlamps shall comply with the following:

(A) Metal shell, paperlined lampholders shall not be used;

(B) Handlamps shall be equipped with a handle of molded composition or other insulating material;

(C) Handlamps shall be equipped with a substantial guard attached to the lampholder or handle;

(D) Metallic guards shall be grounded by the means of an equipment grounding conductor run within the power supply cord.

(iv) Lampholders. Lampholders of the screw-shell type shall be installed for use as lampholders only. Lampholders installed in wet or damp locations shall be of the weatherproof type.

(v) Fixtures. Fixtures installed in wet or damp locations shall be identified for the purpose and shall be installed so that water cannot enter or accumulate in wireways, lampholders, or other electrical parts.



(b) Receptacles, cord connectors, and attachment plugs (caps).

(i) Configuration. Receptacles, cord connectors, and attachment plugs shall be constructed so that no receptacle or cord connector will accept an attachment plug with a different voltage or current rating than that for which the device is intended. However, a 20-ampere T-slot receptacle or cord connector may accept a 15-ampere attachment plug of the same voltage rating. Receptacles connected to circuits having different voltages, frequencies, or types of current (AC or DC) on the same premises shall be of such design that the attachment plugs used on these circuits are not interchangeable.

(ii) Damp and wet locations. A receptacle installed in a wet or damp location shall be designed for the location.

(c) Appliances.

(i) Live parts. Appliances, other than those in which the current-carrying parts at high temperatures are necessarily exposed, shall have no live parts normally exposed to employee contact.

(ii) Disconnecting means. A means shall be provided to disconnect each appliance.

(iii) Rating. Each appliance shall be marked with its rating in volts and amperes or volts and watts.

(d) Motors. This subdivision applies to motors, motor circuits, and controllers.

(i) In sight from. If specified that one piece of equipment shall be "in sight from" another piece of equipment, one shall be visible and not more than 50 feet (15.2 m) from the other.

(ii) Disconnecting means.

(A) A disconnecting means shall be located in sight from the controller location. The controller disconnecting means for motor branch circuits over 750 volts, nominal, may be out of sight of the controller, if the controller is marked with a warning label giving the location and identification of the disconnecting means which is to be locked in the open position.

(B) The disconnecting means shall disconnect the motor and the controller from all ungrounded supply conductors and shall be so designed that no pole can be operated independently.

(C) If a motor and the driven machinery are not in sight from the controller location, the installation shall comply with one of the following conditions:

(I) The controller disconnecting means shall be capable of being locked in the open position.

(II) A manually operable switch that will disconnect the motor from its source of supply shall be placed in sight from the motor location.

(D) The disconnecting means shall plainly indicate whether it is in the open (off) or closed (on) position.

(E) The disconnecting means shall be readily accessible. If more than one disconnect is provided for the same equipment, only one need be readily accessible.

(F) An individual disconnecting means shall be provided for each motor, but a single disconnecting means may be used for a group of motors under any one of the following conditions:

(I) If a number of motors drive special parts of a single machine or piece of apparatus, such as a metal or woodworking machine, crane, or hoist;

(II) If a group of motors is under the protection of one set of branch-circuit protective devices; or

(III) If a group of motors is in a single room in sight from the location of the disconnecting means.

(iii) Motor overload, short-circuit, and ground-fault protection. Motors, motor-control apparatus, and motor branch-circuit conductors shall be protected against overheating due to motor overloads or failure to start, and against short-circuits or ground faults. These provisions do not require overload protection that will stop a motor where a shutdown is likely to introduce additional or increased hazards, as in the case of fire pumps, or where continued operation of a motor is necessary for a safe shutdown of equipment or process and motor overload sensing devices are connected to a supervised alarm.

(iv) Protection of live parts—all voltages.

(A) Stationary motors having commutators, collectors, and brush rigging located inside of motor end brackets and not conductively connected to supply circuits operating at more than 150 volts to ground need not have such parts guarded. Exposed live parts of motors and controllers operating at 50 volts or more between terminals shall be guarded against accidental contact by any of the following:

(I) By installation in a room or enclosure that is accessible only to qualified persons;

(II) By installation on a balcony, gallery, or platform, so elevated and arranged as to exclude unqualified persons; or

(III) By elevation 8 feet (2.44 m) or more above the floor.

(B) Where live parts of motors or controllers operating at over 150 volts to ground are guarded against accidental contact only by location, and where adjustment or other attendance may be necessary during the operation of the apparatus, insulating mats or platforms shall be provided so that the attendant cannot readily touch live parts unless standing on the mats or platforms.

(e) Transformers.

(i) Application. The following subsections cover the installation of all transformers, except:

(A) Current transformers;

(B) Dry-type transformers installed as a component part of other apparatus;

(C) Transformers which are an integral part of an x-ray, high frequency, or electrostatic-coating apparatus;

(D) Transformers used with Class 2 and Class 3 circuits, sign and outline lighting, electric discharge lighting, and power-limited fire-protective signaling circuits.

(E) Transformers mounted on utility poles at a height of more than 12 feet from the ground are exempt from the requirements of this subsection.

(ii) Operating voltage. The operating voltage of exposed live parts of transformer installations shall be indicated by warning signs or visible markings on the equipment or structure.

(iii) Transformers over 35 kV. Dry-type, high fire point liquid-insulated, and askarel-insulated transformers installed indoors and rated over 35 kV shall be in a vault.

(iv) Oil-insulated transformers. If they present a fire hazard to employees, oil-insulated transformers installed indoors shall be in a vault.

(v) Fire protection. Combustible material, combustible buildings and parts of buildings, fire escapes, and door and window openings shall be safeguarded from fires which may originate in oil-insulated transformers attached to or adjacent to a building or combustible material.

(vi) Transformer vaults. Transformer vaults shall be constructed so as to contain fire and combustible liquids within the vault and to prevent unauthorized access. Locks and latches shall be so arranged that a vault door can be readily opened from the inside.

(vii) Pipes and ducts. Any pipe or duct system foreign to the vault installation shall not enter or pass through a transformer vault.

(viii) Material storage. Materials shall not be stored in transformer vaults.

(f) Capacitors.

(i) Drainage of stored charge. All capacitors, except surge capacitors or capacitors included as a component part of other apparatus, shall be provided with an automatic means of draining the stored charge and maintaining the discharged state after the capacitor is disconnected from its source of supply.

(ii) Over 750 volts. Capacitors rated over 750 volts, nominal, shall comply with the following additional requirements:

(A) Isolating or disconnecting switches (with no interrupting rating) shall be interlocked with the load interrupting device or shall be provided with prominently displayed caution signs to prevent switching load current.

(B) For series capacitors the proper switching shall be assured by use of at least one of the following:

(I) Mechanically sequenced isolating and bypass switches;

(II) Interlocks; or

(III) Switching procedure prominently displayed at the switching location.

[Statutory Authority: Chapter 49.17 RCW. 88-11-021 (Order 88-04), § 296-155-449, filed 5/11/88.]

**WAC 296-155-452 Specific purpose equipment and installations.** (1) Cranes and hoists. This subsection applies to the installation of electric equipment and wiring used in connection with cranes, monorail hoists, hoists, and all runways.

(a) Disconnecting means.

(i) Runway conductor disconnecting means. A readily accessible disconnecting means shall be provided between the runway contact conductors and the power supply.

(ii) Disconnecting means for cranes and monorail hoists. A disconnecting means, capable of being locked in the open position, shall be provided in the leads from

the runway contact conductors or other power supply on any crane or monorail hoist.

(A) If this additional disconnecting means is not readily accessible from the crane or monorail hoist operating station, means shall be provided at the operating station to open the power circuit to all motors of the crane or monorail hoist.

(B) The additional disconnect may be omitted if a monorail hoist or hand-propelled crane bridge installation meets all of the following:

(I) The unit is floor controlled;

(II) The unit is within view of the power supply disconnecting means; and

(III) No fixed work platform has been provided for servicing the unit.

(b) Control. A limit switch or other device shall be provided to prevent the load block from passing the safe upper limit of travel of any hoisting mechanism.

(c) Clearance. The dimension of the working space in the direction of access to live parts which may require examination, adjustment, servicing, or maintenance while alive shall be a minimum of 2 feet 6 inches (762 mm). Where controls are enclosed in cabinets, the door(s) shall open at least 90 degrees or be removable, or the installation shall provide equivalent access.

(d) Grounding. All exposed metal parts of cranes, monorail hoists, hoists and accessories including pendant controls shall be metallically joined together into a continuous electrical conductor so that the entire crane or hoist will be grounded in accordance with WAC 296-155-434(6). Moving parts, other than removable accessories or attachments, having metal-to-metal bearing surfaces shall be considered to be electrically connected to each other through the bearing surfaces for grounding purposes. The trolley frame and bridge frame shall be considered as electrically grounded through the bridge and trolley wheels and its respective tracks unless conditions such as paint or other insulating materials prevent reliable metal-to-metal contact. In this case a separate bonding conductor shall be provided.

(2) Elevators, escalators, and moving walks.

(a) Disconnecting means. Elevators, escalators, and moving walks shall have a single means for disconnecting all ungrounded main power supply conductors for each unit.

(b) Control panels. If control panels are not located in the same space as the drive machine, they shall be located in cabinets with doors or panels capable of being locked closed.

(3) Electric welders—disconnecting means.

(a) Motor-generator, AC transformer, and DC rectifier arc welders. A disconnecting means shall be provided in the supply circuit for each motor-generator arc welder, and for each AC transformer and DC rectifier arc welder which is not equipped with a disconnect mounted as an integral part of the welder.

(b) Resistance welders. A switch or circuit breaker shall be provided by which each resistance welder and its control equipment can be isolated from the supply circuit. The ampere rating of this disconnecting means shall not be less than the supply conductor ampacity.

## (4) X-ray equipment.

## (a) Disconnecting means.

(i) General. A disconnecting means shall be provided in the supply circuit. The disconnecting means shall be operable from a location readily accessible from the x-ray control. For equipment connected to a 120-volt branch circuit of 30 amperes or less, a grounding-type attachment plug cap and receptacle of proper rating may serve as a disconnecting means.

(ii) More than one piece of equipment. If more than one piece of equipment is operated from the same high-voltage circuit, each piece or each group of equipment as a unit shall be provided with a high-voltage switch or equivalent disconnecting means. This disconnecting means shall be constructed, enclosed, or located so as to avoid contact by employees with its live parts.

(b) Control-radiographic and fluoroscopic types. Radiographic and fluoroscopic-type equipment shall be effectively enclosed or shall have interlocks that deenergize the equipment automatically to prevent ready access to live current-carrying parts.

[Statutory Authority: Chapter 49.17 RCW. 88-11-021 (Order 88-04), § 296-155-452, filed 5/11/88.]

**WAC 296-155-456 Hazardous (classified) locations.**

(1) Scope. This section sets forth requirements for electric equipment and wiring in locations which are classified depending on the properties of the flammable vapors, liquids or gases, or combustible dusts or fibers which may be present therein and the likelihood that a flammable or combustible concentration or quantity is present. Each room, section or area shall be considered individually in determining its classification. These hazardous (classified) locations are assigned six designations as follows: Class I, Division 1; Class I, Division 2; Class II, Division 1; Class II, Division 2; Class III, Division 1; Class III, Division 2. For definitions of these locations see WAC 296-155-428. All applicable requirements in this part apply to all hazardous (classified) locations, unless modified by provisions of this section.

(a) All components and utilization equipment used in a hazardous location shall be chosen from among those listed by a nationally recognized testing laboratory, such as Underwriters' Laboratories, Inc., or Factory Mutual Engineering Corp., except custom-made components and utilization equipment.

(b) Equipment approved for a specific hazardous location shall not be installed or intermixed with equipment approved for another specific hazardous location.

(2) Electrical installations. Equipment, wiring methods, and installations of equipment in hazardous (classified) locations shall be approved as intrinsically safe or approved for the hazardous (classified) location or safe for the hazardous (classified) location. Requirements for each of these options are as follows:

(a) Intrinsically safe. Equipment and associated wiring approved as intrinsically safe is permitted in any hazardous (classified) location included in its listing or labeling.

## (b) Approved for the hazardous (classified) location.

(i) General. Equipment shall be approved not only for the class of location but also for the ignitable or combustible properties of the specific gas, vapor, dust, or fiber that will be present.

Note: NFPA 70, the National Electrical Code, lists or defines hazardous gases, vapors, and dusts by "groups" characterized by their ignitable or combustible properties.

(ii) Marking. Equipment shall not be used unless it is marked to show the class, group, and operating temperature or temperature range, based on operation in a 40°C ambient, for which it is approved. The temperature marking shall not exceed the ignition temperature of the specific gas, vapor, or dust to be encountered. However, the following provisions modify this marking requirement for specific equipment:

(A) Equipment of the nonheat-producing type (such as junction boxes, conduit, and fitting) and equipment of the heat-producing type having a maximum temperature of not more than 100°C (212°F) need not have a marked operating temperature or temperature range.

(B) Fixed lighting fixtures marked for use only in Class I, Division 2 locations need not be marked to indicate the group.

(C) Fixed general-purpose equipment in Class I locations, other than lighting fixtures, which is acceptable for use in Class I, Division 2 locations need not be marked with the class, group, division, or operating temperature.

(D) Fixed dust-tight equipment, other than lighting fixtures, which is acceptable for use in Class II, Division 2 and Class III locations need not be marked with the class, group, division, or operating temperature.

(c) Safe for the hazardous (classified) location. Equipment which is safe for the location shall be of a type and design which the employer demonstrates will provide protection from the hazards arising from the combustibility and flammability of vapors, liquids, gases, dusts, or fibers.

Note: The National Electrical Code, NFPA 70, contains guidelines for determining the type and design of equipment and installations which will meet this requirement. The guidelines of this document address electric wiring, equipment, and systems installed in hazardous (classified) locations and contain specific provisions for the following: Wiring methods, wiring connections, conductor insulation, flexible cords, sealing and drainage, transformers, capacitors, switches, circuit breakers, fuses, motor controllers, receptacles, attachment plugs, meters, relays, instruments, resistors, generators, motors, lighting fixtures, storage battery charging equipment, electric cranes, electric hoists and similar equipment, utilization equipment, signaling systems, alarm systems, remote control systems, local loud speaker and communication systems, ventilation piping, live parts, lightning surge protection, and grounding. Compliance with these guidelines will constitute one means, but not the only means, of compliance with this subsection.

(3) Conduits. All conduits shall be threaded and shall be made wrench-tight. Where it is impractical to make a threaded joint tight, a bonding jumper shall be utilized.

[Statutory Authority: Chapter 49.17 RCW. 88-11-021 (Order 88-04), § 296-155-456, filed 5/11/88.]

**WAC 296-155-459 Special systems.** (1) Systems over 750 volts, nominal. (a) through (d) of this subsection contain general requirements for all circuits and equipment operated at over 750 volts.

(a) Wiring methods for fixed installations.

(i) Above ground. Above-ground conductors shall be installed in rigid metal conduit, in intermediate metal conduit, in cable trays, in cablebus, in other suitable raceways, or as open runs of metal-clad cable designed for the use and purpose. However, open runs of nonmetallic-sheathed cable or of bare conductors or busbars may be installed in locations which are accessible only to qualified persons. Metallic shielding components, such as tapes, wires, or braids for conductors, shall be grounded. Open runs of insulated wires and cables having a bare lead sheath or a braided outer covering shall be supported in a manner designed to prevent physical damage to the braid or sheath.

(ii) Installations emerging from the ground. Conductors emerging from the ground shall be enclosed in raceways. Raceways installed on poles shall be of rigid metal conduit, intermediate metal conduit, PVC schedule 80 or equivalent extending from the ground line up to a point 8 feet (2.44 m) above finished grade. Conductors entering a building shall be protected by an enclosure from the ground line to the point of entrance. Metallic enclosures shall be grounded.

(b) Interrupting and isolating devices.

(i) Circuit breakers. Circuit breakers located indoors shall consist of metal-enclosed or fire-resistant, cell-mounted units. In locations accessible only to qualified personnel, open mounting of circuit breakers is permitted. A means of indicating the open and closed position of circuit breakers shall be provided.

(ii) Fused cutouts. Fused cutouts installed in buildings or transformer vaults shall be of a type identified for the purpose. They shall be readily accessible for fuse replacement.

(iii) Equipment isolating means. A means shall be provided to completely isolate equipment for inspection and repairs. Isolating means which are not designed to interrupt the load current of the circuit shall be either interlocked with a circuit interrupter or provided with a sign warning against opening them under load.

(c) Mobile and portable equipment.

(i) Power cable connections to mobile machines. A metallic enclosure shall be provided on the mobile machine for enclosing the terminals of the power cable. The enclosure shall include provisions for a solid connection for the ground wire(s) terminal to ground effectively the machine frame. The method of cable termination used shall prevent any strain or pull on the cable from stressing the electrical connections. The enclosure shall have provision for locking so only authorized qualified persons may open it and shall be marked with a sign warning of the presence of energized parts.

(ii) Guarding live parts. All energized switching and control parts shall be enclosed in effectively grounded metal cabinets or enclosures. Circuit breakers and protective equipment shall have the operating means projecting through the metal cabinet or enclosure so these

units can be reset without locked doors being opened. Enclosures and metal cabinets shall be locked so that only authorized qualified persons have access and shall be marked with a sign warning of the presence of energized parts. Collector ring assemblies on revolving-type machines (shovels, draglines, etc.) shall be guarded.

(d) Tunnel installations.

(i) Application. The provisions of this item apply to installation and use of high-voltage power distribution and utilization equipment which is associated with tunnels and which is portable and/or mobile, such as substations, trailers, cars, mobile shovels, draglines, hoists, drills, dredges, compressors, pumps, conveyors, and underground excavators.

(ii) Conductors. Conductors in tunnels shall be installed in one or more of the following:

(A) Metal conduit or other metal raceway;

(B) Type MC cable; or

(C) Other suitable multiconductor cable.

Conductors shall also be so located or guarded as to protect them from physical damage. Multiconductor portable cable may supply mobile equipment. An equipment grounding conductor shall be run with circuit conductors inside the metal raceway or inside the multiconductor cable jacket. The equipment grounding conductor may be insulated or bare.

(iii) Guarding live parts. Bare terminals of transformers, switches, motor controllers, and other equipment shall be enclosed to prevent accidental contact with energized parts. Enclosures for use in tunnels shall be drip-proof, weatherproof, or submersible as required by the environmental conditions.

(iv) Disconnecting means. A disconnecting means that simultaneously opens all ungrounded conductors shall be installed at each transformer or motor location.

(v) Grounding and bonding. All nonenergized metal parts of electric equipment and metal raceways and cable sheaths shall be grounded and bonded to all metal pipes and rails at the portal and at intervals not exceeding 1000 feet (305 m) throughout the tunnel.

(2) Class 1, Class 2, and Class 3 remote control, signaling, and power-limited circuits.

(a) Classification. Class 1, Class 2, or Class 3 remote control, signaling, or power-limited circuits are characterized by their usage and electrical power limitation which differentiates them from light and power circuits. These circuits are classified in accordance with their respective voltage and power limitations as summarized in (a)(i) through (iii) of this subsection.

(i) Class 1 circuits.

(A) A Class 1 power-limited circuit is supplied from a source having a rated output of not more than 30 volts and 1000 volt-amperes.

(B) A Class 1 remote control circuit or a Class 1 signaling circuit has a voltage which does not exceed 750 volts; however, the power output of the source need not be limited.

(ii) Class 2 and Class 3 circuits.

(A) Power for Class 2 and Class 3 circuits is limited either inherently (in which no overcurrent protection is

required) or by a combination of a power source and overcurrent protection.

(B) The maximum circuit voltage is 150 volts AC or DC for a Class 2 inherently limited power source, and 100 volts AC or DC for a Class 3 inherently limited power source.

(C) The maximum circuit voltage is 30 volts AC and 60 volts DC for a Class 2 power source limited by overcurrent protection, and 150 volts AC or DC for a Class 3 power source limited by overcurrent protection.

(iii) Application. The maximum circuit voltages in (a)(i) and (ii) of this subsection apply to sinusoidal AC or continuous DC power sources, and where wet contact occurrence is not likely.

(b) Marking. A Class 2 or Class 3 power supply unit shall not be used unless it is durably marked where plainly visible to indicate the class of supply and its electrical rating.

(3) Communications systems.

(a) Scope. These provisions for communication systems apply to such systems as central-station-connected and noncentral-station-connected telephone circuits, radio receiving and transmitting equipment, and outside wiring for fire and burglar alarm, and similar central station systems. These installations need not comply with the provisions of WAC 296-155-444 through 296-155-459(2), except WAC 296-155-447 (3)(a)(ii) and 296-155-456.

(b) Protective devices.

(i) Circuits exposed to power conductors. Communication circuits so located as to be exposed to accidental contact with light or power conductors operating at over 300 volts shall have each circuit so exposed provided with an approved protector.

(ii) Antenna lead-ins. Each conductor of a lead-in from an outdoor antenna shall be provided with an antenna discharge unit or other means that will drain static charges from the antenna system.

(c) Conductor location.

(i) Outside of buildings.

(A) Receiving distribution lead-in or aerial-drop cables attached to buildings and lead-in conductors to radio transmitters shall be so installed as to avoid the possibility of accidental contact with electric light or power conductors.

(B) The clearance between lead-in conductors and any lightning protection conductors shall not be less than 6 feet (1.83 m).

(ii) On poles. Where practicable, communication conductors on poles shall be located below the light or power conductors. Communications conductors shall not be attached to a crossarm that carries light or power conductors.

(iii) Inside of buildings. Indoor antennas, lead-ins, and other communication conductors attached as open conductors to the inside of buildings shall be located at least 2 inches (50.8 mm) from conductors of any light or power or Class 1 circuits unless a special and equally protective method of conductor separation is employed.

(d) Equipment location. Outdoor metal structures supporting antennas, as well as self-supporting antennas

such as vertical rods or dipole structures, shall be located as far away from overhead conductors of electric light and power circuits of over 150 volts to ground as necessary to avoid the possibility of the antenna or structure falling into or making accidental contact with such circuits.

(e) Grounding.

(i) Lead-in conductors. If exposed to contact with electric light or power conductors, the metal sheath of aerial cables entering buildings shall be grounded or shall be interrupted close to the entrance to the building by an insulating joint or equivalent device. Where protective devices are used, they shall be grounded.

(ii) Antenna structures. Masts and metal structures supporting antennas shall be permanently and effectively grounded without splice or connection in the grounding conductor.

(iii) Equipment enclosures. Transmitters shall be enclosed in a metal frame or grill or separated from the operating space by a barrier, all metallic parts of which are effectively connected to ground. All external metal handles and controls accessible to the operating personnel shall be effectively grounded. Unpowered equipment and enclosures shall be considered grounded where connected to an attached coaxial cable with an effectively grounded metallic shield.

[Statutory Authority: Chapter 49.17 RCW. 88-11-021 (Order 88-04), § 296-155-459, filed 5/11/88.]

**WAC 296-155-462 Definitions applicable to this part.** The definitions given in this section apply to the terms used in Part I. The definitions given here for "approved" and "qualified person" apply, instead of the definitions given in WAC 296-155-012, to the use of these terms in Part I.

(1) "Acceptable." An installation or equipment is acceptable to the director, and approved within the meaning of this Part I:

(a) If it is accepted, certified, listed, labeled, or otherwise determined to be safe by a qualified testing laboratory capable of determining the suitability of materials and equipment for installation and use in accordance with this standard; or

(b) With respect to an installation or equipment of a kind which no qualified testing laboratory accepts, certifies, lists, labels, or determines to be safe, if it is inspected or tested by another state agency, or by a federal, municipal, or other local authority responsible for enforcing occupational safety provisions of the National Electrical Code, and found in compliance with those provisions; or

(c) With respect to custom-made equipment or related installations which are designed, fabricated for, and intended for use by a particular customer, if it is determined to be safe for its intended use by its manufacturer on the basis of test data which the employer keeps and makes available for inspection to the director and his authorized representatives.

(2) "Accepted." An installation is "accepted" if it has been inspected and found to be safe by a qualified testing laboratory.

(3) "Accessible." (As applied to wiring methods.) Capable of being removed or exposed without damaging the building structure or finish, or not permanently closed in by the structure or finish of the building. (See "concealed" and "exposed.")

(4) "Accessible." (As applied to equipment.) Admitting close approach; not guarded by locked doors, elevation, or other effective means. (See "readily accessible.")

(5) "Ampacity." The current in amperes a conductor can carry continuously under the conditions of use without exceeding its temperature rating.

(6) "Appliances." Utilization equipment, generally other than industrial, normally built in standardized sizes or types, which is installed or connected as a unit to perform one or more functions.

(7) "Approved." Approved by the director of the department of labor and industries or his authorized representative: *Provided, however*, That should a provision of this chapter state that approval by an agency or organization other than the department of labor and industries is required, such as Underwriters' Laboratories or the bureau of mines, the provisions of WAC 296-155-006 shall apply.

(8) "Askarel." A generic term for a group of non-flammable synthetic chlorinated hydrocarbons used as electrical insulating media. Askarels of various compositional types are used. Under arcing conditions the gases produced, while consisting predominantly of noncombustible hydrogen chloride, can include varying amounts of combustible gases depending upon the askarel type.

(9) "Attachment plug (plug cap) (cap)." A device which, by insertion in a receptacle, establishes connection between the conductors of the attached flexible cord and the conductors connected permanently to the receptacle.

(10) "Automatic." Self-acting, operating by its own mechanism when actuated by some impersonal influence, as for example, a change in current strength, pressure, temperature, or mechanical configuration.

(11) "Bare conductor." See "conductor."

(12) "Bonding." The permanent joining of metallic parts to form an electrically conductive path which will assure electrical continuity and the capacity to conduct safely any current likely to be imposed.

(13) "Bonding jumper." A reliable conductor to assure the required electrical conductivity between metal parts required to be electrically connected.

(14) "Branch circuits." That portion of a wiring system extending beyond the final overcurrent device protecting the circuit. (A device not approved for branch circuit protection, such as thermal cutout or motor overload protective device, is not considered as the overcurrent device protecting the circuit.)

(15) "Building." A structure which stands alone or which is cut off from adjoining structures by fire walls with all openings therein protected by approved fire doors.

(16) "Cabinet." An enclosure designed either for surface or flush mounting, and provided with a frame, mat, or trim in which a swinging door or doors are or may be hung.

(17) "Certified." Equipment is "certified" if it:

(a) Has been tested and found by a qualified testing laboratory to meet applicable test standards or to be safe for use in a specified manner; and

(b) Is of a kind whose production is periodically inspected by a qualified testing laboratory. Certified equipment must bear a label, tag, or other record of certification.

(18) "Circuit breaker."

(a) (750 volts nominal, or less.) A device designed to open and close a circuit by nonautomatic means and to open the circuit automatically on a predetermined overcurrent without injury to itself when properly applied within its rating.

(b) (Over 750 volts, nominal.) A switching device capable of making, carrying, and breaking currents under normal circuit conditions, and also making, carrying for a specified time, and breaking currents under specified abnormal circuit conditions, such as those of short circuit.

(19) "Class I locations." Class I locations are those in which flammable gases or vapors are or may be present in the air in quantities sufficient to produce explosive or ignitable mixtures. Class I locations include the following:

(a) Class I, Division 1. A Class I, Division 1 location is a location:

(i) In which ignitable concentrations of flammable gases or vapors may exist under normal operating conditions; or

(ii) In which ignitable concentrations of such gases or vapors may exist frequently because of repair or maintenance operations or because of leakage; or

(iii) In which breakdown or faulty operation of equipment or processes might release ignitable concentrations of flammable gases or vapors, and might also cause simultaneous failure of electric equipment.

Note: This classification usually includes locations where volatile flammable liquids or liquefied flammable gases are transferred from one container to another; interiors of spray booths and areas in the vicinity of spraying and painting operations where volatile flammable solvents are used; locations containing open tanks or vats of volatile flammable liquids; drying rooms or compartments for the evaporation of flammable solvents; inadequately ventilated pump rooms for flammable gas or for volatile flammable liquids; and all other locations where ignitable concentrations of flammable vapors or gases are likely to occur in the course of normal operations.

(b) Class I, Division 2. A Class I, Division 2 location is a location:

(i) In which volatile flammable liquids or flammable gases are handled, processed, or used, but in which the hazardous liquids, vapors, or gases will normally be confined within closed containers or closed systems from which they can escape only in case of accidental rupture or breakdown of such containers or systems, or in case of abnormal operation of equipment; or

(ii) In which ignitable concentrations of gases or vapors are normally prevented by positive mechanical ventilation, and which might become hazardous through failure or abnormal operations of the ventilating equipment; or



(iii) That is adjacent to a Class I, Division 1 location, and to which ignitable concentrations of gases or vapors might occasionally be communicated unless such communication is prevented by adequate positive-pressure ventilation from a source of clean air, and effective safeguards against ventilation failure are provided.

Note: This classification usually includes locations where volatile flammable liquids or flammable gases or vapors are used, but which would become hazardous only in case of an accident or of some unusual operating condition. The quantity of flammable material that might escape in case of accident, the adequacy of ventilating equipment, the total area involved, and the record of the industry or business with respect to explosions or fires are all factors that merit consideration in determining the classification and extent of each location.

Piping without valves, checks, meters, and similar devices would not ordinarily introduce a hazardous condition even though used for flammable liquids or gases. Locations used for the storage of flammable liquids or of liquefied or compressed gases in sealed containers would not normally be considered hazardous unless also subject to other hazardous conditions.

Electrical conduits and their associated enclosures separated from process fluids by a single seal or barrier are classed as a Division 2 location if the outside of the conduit and enclosures is a nonhazardous location.

(20) "Class II locations." Class II locations are those that are hazardous because of the presence of combustible dust. Class II locations include the following:

(a) Class II, Division 1. A Class II, Division 1 location is a location:

(i) In which combustible dust is or may be in suspension in the air under normal operating conditions, in quantities sufficient to produce explosive or ignitable mixtures; or

(ii) Where mechanical failure or abnormal operation of machinery or equipment might cause such explosive or ignitable mixtures to be produced, and might also provide a source of ignition through simultaneous failure of electric equipment, operation of protection devices, or from other causes; or

(iii) In which combustible dusts of an electrically conductive nature may be present.

Note: Combustible dusts which are electrically nonconductive include dusts produced in the handling and processing of grain and grain products, pulverized sugar and cocoa, dried egg and milk powders, pulverized spices, starch and pastes, potato and woodflour, oil meal from beans and seed, dried hay, and other organic materials which may produce combustible dusts when processed or handled. Dusts containing magnesium or aluminum are particularly hazardous and the use of extreme caution is necessary to avoid ignition and explosion.

(b) Class II, Division 2. A Class II, Division 2 location is a location in which:

(i) Combustible dust will not normally be in suspension in the air in quantities sufficient to produce explosive or ignitable mixtures, and dust accumulations are normally insufficient to interfere with the normal operation of electrical equipment or other apparatus; or

(ii) Dust may be in suspension in the air as a result of infrequent malfunctioning of handling or processing equipment, and dust accumulations resulting therefrom

may be ignitable by abnormal operation or failure of electrical equipment or other apparatus.

Note: This classification includes locations where dangerous concentrations of suspended dust would not be likely but where dust accumulations might form on or in the vicinity of electric equipment. These areas may contain equipment from which appreciable quantities of dust would escape under abnormal operating conditions or be adjacent to a Class II, Division 1 location, as described above, into which an explosive or ignitable concentration of dust may be put into suspension under abnormal operating conditions.

(21) "Class III locations." Class III locations are those that are hazardous because of the presence of easily ignitable fibers or flyings but in which such fibers or flyings are not likely to be in suspension in the air in quantities sufficient to produce ignitable mixtures. Class III locations include the following:

(a) Class III, Division 1. A Class III, Division 1 location is a location in which easily ignitable fibers or materials producing combustible flyings are handled, manufactured, or used.

Note: Easily ignitable fibers and flyings include rayon, cotton (including cotton linters and cotton waste), sisal or henequen,istle, jute, hemp, tow, cocoa fiber, oakum, baled waste kapok, Spanish moss, excelsior, sawdust, woodchips, and other material of similar nature.

(b) Class III, Division 2. A Class III, Division 2 location is a location in which easily ignitable fibers are stored or handled, except in process of manufacture. Collector ring. A collector ring is an assembly of slip rings for transferring electrical energy from a stationary to a rotating member.

(22) "Collector ring." A collector ring is an assembly of slip rings for transferring electrical energy from a stationary to a rotating member.

(23) "Concealed." Rendered inaccessible by the structure or finish of the building. Wires in concealed raceways are considered concealed, even though they may become accessible by withdrawing them. See "accessible. (As applied to wiring methods.)"

(24) "Conductor."

(a) Bare. A conductor having no covering or electrical insulation whatsoever.

(b) Covered. A conductor encased within material of composition or thickness that is not recognized as electrical insulation.

(c) Insulated. A conductor encased within material of composition and thickness that is recognized as electrical insulation.

(25) "Controller." A device or group of devices that serves to govern, in some predetermined manner, the electric power delivered to the apparatus to which it is connected.

(26) "Covered conductor." See "conductor."

(27) "Cutout." (Over 750 volts, nominal.) An assembly of a fuse support with either a fuseholder, fuse carrier, or disconnecting blade. The fuseholder or fuse carrier may include a conducting element (fuse link), or may act as the disconnecting blade by the inclusion of a nonfusible member.

(28) "Cutout box." An enclosure designed for surface mounting and having swinging doors or covers secured



directly to and telescoping with the walls of the box proper. (See "cabinet.")

(29) "Damp location." See "location."

(30) "Dead front." Without live parts exposed to a person on the operating side of the equipment.

(31) "Device." A unit of an electrical system which is intended to carry but not utilize electric energy.

(32) "Disconnecting means." A device, or group of devices, or other means by which the conductors of a circuit can be disconnected from their source of supply.

(33) "Disconnecting (or isolating) switch." (Over 750 volts, nominal.) A mechanical switching device used for isolating a circuit or equipment from a source of power.

(34) "Dry location." See "location."

(35) "Enclosed." Surrounded by a case, housing, fence or walls which will prevent persons from accidentally contacting energized parts.

(36) "Enclosure." The case or housing of apparatus, or the fence or walls surrounding an installation to prevent personnel from accidentally contacting energized parts, or to protect the equipment from physical damage.

(37) "Equipment." A general term including material, fittings, devices, appliances, fixtures, apparatus, and the like, used as a part of, or in connection with, an electrical installation.

(38) "Equipment grounding conductor." See "grounding conductor, equipment."

(39) "Explosion-proof apparatus." Apparatus enclosed in a case that is capable of withstanding an explosion of a specified gas or vapor which may occur within it and of preventing the ignition of a specified gas or vapor surrounding the enclosure by sparks, flashes, or explosion of the gas or vapor within, and which operates at such an external temperature that it will not ignite a surrounding flammable atmosphere.

(40) "Exposed. (As applied to live parts.)" Capable of being inadvertently touched or approached nearer than a safe distance by a person. It is applied to parts not suitably guarded, isolated, or insulated. (See "accessible" and "concealed.")

(41) "Exposed. (As applied to wiring methods.)" On or attached to the surface or behind panels designed to allow access. See "accessible. (As applied to wiring methods.)"

(42) "Exposed. (For the purposes of WAC 296-155-459(4), Communications systems.)" Where the circuit is in such a position that in case of failure of supports or insulation, contact with another circuit may result.

(43) "Externally operable." Capable of being operated without exposing the operator to contact with live parts.

(44) "Feeder." All circuit conductors between the service equipment, or the generator switchboard of an isolated plant, and the final branch-circuit overcurrent device.

(45) "Festoon lighting." A string of outdoor lights suspended between two points more than 15 feet (4.57 m) apart.

(46) "Fitting." An accessory such as a locknut, bushing, or other part of a wiring system that is intended primarily to perform a mechanical rather than an electrical function.

(47) "Fuse." (Over 750 volts, nominal.) An overcurrent protective device with a circuit opening fusible part that is heated and severed by the passage of overcurrent through it. A fuse comprises all the parts that form a unit capable of performing the prescribed functions. It may or may not be the complete device necessary to connect it into an electrical circuit.

(48) "Ground." A conducting connection, whether intentional or accidental, between an electrical circuit or equipment and the earth, or to some conducting body that serves in place of the earth.

(49) "Grounded." Connected to earth or to some conducting body that serves in place of the earth.

(50) "Grounded, effectively." (Over 750 volts, nominal.) Permanently connected to earth through a ground connection of sufficiently low impedance and having sufficient ampacity that ground fault current which may occur cannot build up to voltages dangerous to personnel.

(51) "Grounded conductor." A system or circuit conductor that is intentionally grounded.

(52) "Grounding conductor." A conductor used to connect equipment or the grounded circuit of a wiring system to a grounding electrode or electrodes.

(53) "Grounding conductor, equipment." The conductor used to connect the noncurrent-carrying metal parts of equipment, raceways, and other enclosures to the system grounded conductor and/or the grounding electrode conductor at the service equipment or at the source of a separately derived system.

(54) "Grounding electrode conductor." The conductor used to connect the grounding electrode to the equipment grounding conductor and/or to the grounded conductor of the circuit at the service equipment or at the source of a separately derived system.

(55) "Ground-fault circuit interrupter." A device for the protection of personnel that functions to deenergize a circuit or portion thereof within an established period of time when a current to ground exceeds some predetermined value that is less than that required to operate the overcurrent protective device of the supply circuit.

(56) "Guarded." Covered, shielded, fenced, enclosed, or otherwise protected by means of suitable covers, casings, barriers, rails, screens, mats, or platforms to remove the likelihood of approach to a point of danger or contact by persons or objects.

(57) "Hazard." That condition, potential or inherent, which is likely to cause injury, death, or occupational disease.

(58) "Hoistway." Any shaftway, hatchway, well hole, or other vertical opening or space in which an elevator or dumbwaiter is designed to operate.

(59) "Identified (conductors or terminals)." Identified, as used in reference to a conductor or its terminal, means that such conductor or terminal can be recognized as grounded.

(60) "Identified (for the use)." Recognized as suitable for the specific purpose, function, use, environment, application, etc., where described as a requirement in this standard. Suitability of equipment for a specific purpose, environment, or application is determined by a qualified

testing laboratory where such identification includes labeling or listing.

(61) "Insulated conductor." See "conductor."

(62) "Interrupter switch." (Over 750 volts, nominal.) A switch capable of making, carrying, and interrupting specified currents.

(63) "Intrinsically safe equipment and associated wiring." Equipment and associated wiring in which any spark or thermal effect, produced either normally or in specified fault conditions, is incapable, under certain prescribed test conditions, of causing ignition of a mixture of flammable or combustible material in air in its most easily ignitable concentration.

(64) "Isolated." Not readily accessible to persons unless special means for access are used.

(65) "Isolated power system." A system comprising an isolating transformer or its equivalent, a line isolation monitor, and its ungrounded circuit conductors.

(66) "J-Box (junction box)." An electrical sheet metal enclosure with openings for conduit or cable with sheet metal cover. The primary purpose is for joining conductors for splicing.

(67) "Labeled." Equipment or materials to which has been attached a label, symbol or other identifying mark of a qualified testing laboratory which indicates compliance with appropriate standards or performance in a specified manner.

(68) "Lighting outlet." An outlet intended for the direct connection of a lampholder, a lighting fixture, or a pendant cord terminating in a lampholder.

(69) "Listed." Equipment or materials included in a list published by a qualified testing laboratory whose listing states either that the equipment or material meets appropriate standards or has been tested and found suitable for use in a specified manner.

(70) "Location."

(a) Damp location. Partially protected locations under canopies, marquees, roofed open porches, and like locations, and interior locations subject to moderate degrees of moisture, such as some basements.

(b) Dry location. A location not normally subject to dampness or wetness. A location classified as dry may be temporarily subject to dampness or wetness, as in the case of a building under construction.

(c) Wet location. Installations underground or in concrete slabs or masonry in direct contact with the earth, and locations subject to saturation with water or other liquids, such as locations exposed to weather and unprotected.

(71) "Mobile x-ray." X-ray equipment mounted on a permanent base with wheels and/or casters for moving while completely assembled.

(72) "Motor control center." An assembly of one or more enclosed sections having a common power bus and principally containing motor control units.

(73) "Outlet." A point on the wiring system at which current is taken to supply utilization equipment.

(74) "Overcurrent." Any current in excess of the rated current of equipment or the ampacity of a conductor. It may result from overload (see definition),

short circuit, or ground fault. A current in excess of rating may be accommodated by certain equipment and conductors for a given set of conditions. Hence the rules for overcurrent protection are specific for particular situations.

(75) "Overload." Operation of equipment in excess of normal, full load rating, or of a conductor in excess of rated ampacity which, when it persists for a sufficient length of time, would cause damage or dangerous overheating. A fault, such as a short circuit or ground fault, is not an overload. (See "overcurrent.")

(76) "Panelboard." A single panel or group of panel units designed for assembly in the form of a single panel; including buses, automatic overcurrent devices, and with or without switches for the control of light, heat, or power circuits; designed to be placed in a cabinet or cutout box placed in or against a wall or partition and accessible only from the front. (See "switchboard.")

(77) "Portable x-ray." X-ray equipment designed to be hand-carried.

(78) "Power fuse." (Over 750 volts, nominal.) See "fuse."

(79) "Power outlet." An enclosed assembly which may include receptacles, circuit breakers, fuseholders, fused switches, buses and watt-hour meter mounting means; intended to serve as a means for distributing power required to operate mobile or temporarily installed equipment.

(80) "Premises wiring system." That interior and exterior wiring, including power, lighting, control, and signal circuit wiring together with all of its associated hardware, fittings, and wiring devices, both permanently and temporarily installed, which extends from the load end of the service drop, or load end of the service lateral conductors to the outlet(s). Such wiring does not include wiring internal to appliances, fixtures, motors, controllers, motor control centers, and similar equipment.

(81) "Qualified person." One familiar with the construction and operation of the equipment and the hazards involved.

(82) "Qualified testing laboratory." A properly equipped and staffed testing laboratory which has capabilities for and which provides the following services:

(a) Experimental testing for safety of specified items of equipment and materials referred to in this standard to determine compliance with appropriate test standards or performance in a specified manner;

(b) Inspecting the run of such items of equipment and materials at factories for product evaluation to assure compliance with the test standards;

(c) Service-value determinations through field inspections to monitor the proper use of labels on products and with authority for recall of the label in the event a hazardous product is installed;

(d) Employing a controlled procedure for identifying the listed and/or labeled equipment or materials tested; and

(e) Rendering creditable reports or findings that are objective and without bias of the tests and test methods employed.

(83) "Raceway." A channel designed expressly for holding wires, cables, or busbars, with additional functions as permitted in this part. Raceways may be of metal or insulating material, and the term includes rigid metal conduit, rigid nonmetallic conduit, intermediate metal conduit, liquidtight flexible metal conduit, flexible metallic tubing, flexible metal conduit, electrical metallic tubing, underfloor raceways, cellular concrete floor raceways, cellular metal floor raceways, surface raceways, wireways, and busways.

(84) "Readily accessible." Capable of being reached quickly for operation, renewal, or inspections, without requiring those to whom ready access is requisite to climb over or remove obstacles or to resort to portable ladders, chairs, etc. (See "accessible.")

(85) "Receptacle." A receptacle is a contact device installed at the outlet for the connection of a single attachment plug. A single receptacle is a single contact device with no other contact device on the same yoke. A multiple receptacle is a single device containing two or more receptacles.

(86) "Receptacle outlet." An outlet where one or more receptacles are installed.

(87) "Remote-control circuit." Any electric circuit that controls any other circuit through a relay or an equivalent device.

(88) "Sealable equipment." Equipment enclosed in a case or cabinet that is provided with a means of sealing or locking so that live parts cannot be made accessible without opening the enclosure. The equipment may or may not be operable without opening the enclosure.

(89) "Separately derived system." A premises wiring system whose power is derived from generator, transformer, or converter windings and has no direct electrical connection, including a solidly connected grounded circuit conductor, to supply conductors originating in another system.

(90) "Service." The conductors and equipment for delivering energy from the electricity supply system to the wiring system of the premises served.

(91) "Service conductors." The supply conductors that extend from the street main or from transformers to the service equipment of the premises supplied.

(92) "Service drop." The overhead service conductors from the last pole or other aerial support to and including the splices, if any, connecting to the service-entrance conductors at the building or other structure.

(93) "Service-entrance conductors, overhead system." The service conductors between the terminals of the service equipment and a point usually outside the building, clear of building walls, where joined by tap or splice to the service drop.

(94) "Service-entrance conductors, underground system." The service conductors between the terminals of the service equipment and the point of connection to the service lateral. Where service equipment is located outside the building walls, there may be no service-entrance conductors, or they may be entirely outside the building.

(95) "Service equipment." The necessary equipment, usually consisting of a circuit breaker or switch and

fuses, and their accessories, located near the point of entrance of supply conductors to a building or other structure, or an otherwise defined area, and intended to constitute the main control and means of cutoff of the supply.

(96) "Service raceway." The raceway that encloses the service-entrance conductors.

(97) "Shock hazard." To exist at an accessible part in a circuit between the part and ground, or other accessible parts if the potential is more than 42.4 volts peak and the current through a 1,500-ohm load is more than 5 milliamperes.

(98) "Signaling circuit." Any electric circuit that energizes signaling equipment.

(99) "Switchboard." A large single panel, frame, or assembly of panels which have switches, buses, instruments, overcurrent and other protective devices mounted on the face or back or both. Switchboards are generally accessible from the rear as well as from the front and are not intended to be installed in cabinets. (See "panelboard.")

(100) "Switches."

(a) General-use switch. A switch intended for use in general distribution and branch circuits. It is rated in amperes, and it is capable of interrupting its rated current at its rated voltage.

(b) General-use snap switch. A form of general-use switch so constructed that it can be installed in flush device boxes or on outlet box covers, or otherwise used in conjunction with wiring systems recognized by this part.

(c) Isolating switch. A switch intended for isolating an electric circuit from the source of power. It has no interrupting rating, and it is intended to be operated only after the circuit has been opened by some other means.

(d) Motor-circuit switch. A switch, rated in horsepower, capable of interrupting the maximum operating overload current of a motor of the same horsepower rating as the switch at the rated voltage.

(101) "Switching devices." (Over 750 volts, nominal.) Devices designed to close and/or open one or more electric circuits. Included in this category are circuit breakers, cutouts, disconnecting (or isolating) switches, disconnecting means, and interrupter switches.

(102) "Transformer." A transformer is an apparatus for converting electrical power in an a-c system at one voltage or current into electrical power at some other voltage or current without the use of rotating parts.

(103) "Transportable x-ray." X-ray equipment installed in a vehicle or that may readily be disassembled for transport in a vehicle.

(104) "Utilization equipment." Utilization equipment means equipment which utilizes electric energy for mechanical, chemical, heating, lighting, or similar useful purpose.

(105) "Utilization system." A utilization system is a system which provides electric power and light for employee workplaces, and includes the premises wiring system and utilization equipment.

(106) "Ventilated." Provided with a means to permit circulation of air sufficient to remove an excess of heat, fumes, or vapors.

(107) "Volatile flammable liquid." A flammable liquid having a flash point below 38°C (100°F) or whose temperature is above its flash point, or a Class II combustible liquid having a vapor pressure not exceeding 40 psia (276 kPa) at 38°C (100°F) whose temperature is above its flash point.

(108) "Voltage." (Of a circuit.) The greatest root-mean-square (effective) difference of potential between any two conductors of the circuit concerned.

(109) "Voltage, nominal." A nominal value assigned to a circuit or system for the purpose of conveniently designating its voltage class (as 120/240, 480Y/277, 750, etc.). The actual voltage at which a circuit operates can vary from the nominal within a range that permits satisfactory operation of equipment.

(110) "Voltage to ground." For grounded circuits, the voltage between the given conductor and that point or conductor of the circuit that is grounded; for ungrounded circuits, the greatest voltage between the given conductor and any other conductor of the circuit.

(111) "Watertight." So constructed that moisture will not enter the enclosure.

(112) "Weatherproof." So constructed or protected that exposure to the weather will not interfere with successful operation. Rainproof, raintight, or watertight equipment can fulfill the requirements for weatherproof where varying weather conditions other than wetness, such as snow, ice, dust, or temperature extremes, are not a factor.

(113) "Wet location." See "location."

[Statutory Authority: Chapter 49.17 RCW. 88-11-021 (Order 88-04), § 296-155-462, filed 5/11/88.]

## Part J

### LADDERS, SCAFFOLDS AND ELEVATING WORK PLATFORMS

#### WAC

296-155-475	Definitions.
296-155-480	Ladders.
296-155-48090	Table J-18.
296-155-485	Scaffolding.
296-155-48503	Table J-1.
296-155-48504	Table J-2.
296-155-48505	Table J-3.
296-155-48506	Table J-4.
296-155-48507	Table J-5.
296-155-48508	Table J-6.
296-155-48509	Table J-7.
296-155-48510	Table J-8.
296-155-48511	Table J-9.
296-155-48512	Table J-10.
296-155-48513	Table J-11.
296-155-48514	Table J-12.
296-155-48515	Table J-13.
296-155-48516	Table J-14.
296-155-48517	Table J-15.
296-155-48518	Table J-16.
296-155-48519	Table J-17.
296-155-48523	Manually propelled mobile ladder stands and scaffolds (towers).
296-155-48525	Manually propelled elevating work platforms.
296-155-48527	Self propelled elevating work platforms.
296-155-48529	Boom supported elevating work platforms.
296-155-48531	Vehicle mounted elevating and rotating aerial devices.
296-155-48533	Crane or derrick suspended personnel platforms.

(1989 Ed.)

296-155-48536 Forklift elevated work platforms.

#### DISPOSITION OF SECTIONS FORMERLY CODIFIED IN THIS SUBCHAPTER

- 296-155-48501 Figure J-1. [Order 76-29, Figure J-1 (codified as WAC 296-155-48501), filed 9/30/76; Order 74-26, § 296-155-485 (part), Figure J-1, filed 5/7/74, effective 6/6/74.] Repealed by 82-08-026 (Order 82-10), filed 3/30/82. Statutory Authority: RCW 49.17-.040 and 49.17.050.
- 296-155-48502 Figure J-2. [Order 76-29, Figure J-2 (codified as WAC 296-155-48502), filed 9/30/76; Order 74-26, § 296-155-485 (part), Figure J-2, filed 5/7/74, effective 6/6/74.] Repealed by 82-08-026 (Order 82-10), filed 3/30/82. Statutory Authority: RCW 49.17-.040 and 49.17.050.

#### WAC 296-155-475 Definitions. (1) "Ladders"

(a) "Cleats" means ladder crosspieces of rectangular cross section placed on edge on which a person may step in ascending or descending.

(b) "Single cleat ladder" means one which consists of a pair of side rails, usually parallel, but with flared side rails permissible, connected together with cleats that are joined to the side rails at regular intervals.

(c) "Double cleat ladder" means one that is similar to a single cleat ladder, but is wider, with an additional center rail which will allow for two-way traffic for workers in ascending and descending.

(2) "Scaffolding"

(a) "Bearer" means a horizontal member of a scaffold upon which the platform rests and which may be supported by ledgers.

(b) "Boatswain's chair" means a seat supported by slings attached to a suspended rope, designed to accommodate one employee in a sitting position.

(c) "Brace" means a tie that holds one scaffold member in a fixed position with respect to another member.

(d) "Bricklayers' square scaffold" means a scaffold composed of framed wood squares which support a platform, limited to light and medium duty.

(e) "Built-up scaffold" means a rigidly constructed scaffold, built up where it is going to be used and dismantled when its purpose has been accomplished.

(f) "Carpenters' bracket scaffold" means a scaffold consisting of wood or metal brackets supporting a platform.

(g) "Coupler" means a device for locking together the component parts of a tubular metal scaffold. (The material used for the couplers shall be of a structural type, such as a dropforged steel, malleable iron, or structural grade aluminum.)

(h) "Crawling board or chicken ladder" means a plank with cleats spaced and secured at equal intervals, for use by a worker on roofs, not designed to carry any material.

(i) "Double pole or independent pole scaffold" means a scaffold supported from the base by a double row of uprights, independent of support from the walls and constructed of uprights, ledgers, horizontal platform bearers, and diagonal bracing.

(j) "Float or ship scaffold" means a scaffold hung from overhead supports by means of ropes and consisting

of a substantial platform having diagonal bracing underneath, resting upon and securely fastened to two parallel plank bearers at right angles to the span.

(k) "Standard guardrail" means a horizontal barrier at the perimeter of any surface edge presenting a potential fall hazard constructed to provide a smooth surfaced top rail a distance of not more than 42 inches or less than 36 inches above the walking surface. An intermediate rail shall be installed half way between the walking surface and the top of the top rail.

The anchoring of posts and framing of members for railings of all types shall be such that the completed structure is capable of withstanding a load of at least 200 pounds applied in any direction at any point on the top rail with a minimum deflection.

Note: Where 2 x 4 inch lumber is used for rails and posts, upright posts spaced at intervals not exceeding 8 feet will achieve the 200 pounds loading criteria.

(l) "Heavy duty scaffold" means a scaffold designed and constructed to carry a working load not to exceed 75 pounds per square foot.

(m) "Horse scaffold" means a scaffold for light or medium duty, composed of horses supporting a work platform.

(n) "Interior hung scaffold" means a scaffold suspended from the ceiling or roof structure.

(o) "Ladder jack scaffold" means a light duty scaffold supported by brackets attached to ladders.

(p) "Leaning horse scaffold" means scaffold planks resting on two half horses supported by two legs on the ground with the point of the bearer resting against a solid portion of a structure.

(q) "Ledgers (stringer)" mean a horizontal scaffold member which extends from post to post and which supports the putlogs or bearers forming a tie between the posts.

(r) "Light duty scaffold" means a scaffold designed and constructed to carry a working load not to exceed 25 pounds per square foot.

(s) "Manually propelled mobile scaffold" means a portable rolling scaffold supported by casters.

(t) "Masons' adjustable multiple-point suspension scaffold" means a scaffold having a continuous platform supported by bearers suspended by wire rope from overhead supports, so arranged and operated as to permit the raising or lowering of the platform to desired working positions.

(u) "Maximum rated load" means the total of all loads including the working load, the weight of the scaffold, and such other loads as may be reasonably anticipated for which the scaffold is designed.

(v) "Medium duty scaffold" means a scaffold designed and constructed to carry a working load not to exceed 50 pounds per square foot.

(3) Additional definitions for "scaffolding":

(a) "Midrail" means a rail approximately midway between the guardrail and platform, secured to the uprights erected along the exposed sides and ends of platforms.

(b) "Needle beam scaffold" means a light duty scaffold consisting of needle beams supporting a platform.

(c) "Outrigger scaffold" means a scaffold supported by outriggers or thrustouts projecting beyond the wall or face of the building or structure, the inboard ends of which are secured inside or on the roof of such building or structure.

(d) "Plasters-lathers scaffold" means a tubular welded scaffold erected for, and used primarily by, the plasterer and lather trades.

(e) "Putlog" means a scaffold member upon which the platform rests.

(f) "Roofing or bearer bracket" means a bracket used in slope roof construction, having provisions for fastening to the roof or supported by ropes fastened over the ridge and secured to some suitable object.

(g) "Runner" means the lengthwise horizontal bracing or bearing members or both.

(h) "Scaffold" means any temporary elevated platform and its supporting structure used for supporting workers or materials, or both.

(i) "Single-point adjustable suspension scaffold" means a manually or power-operated unit designed for light duty use, supported by a single wire rope from an overhead support so arranged and operated as to permit the raising or lowering of the platform to desired working positions.

(j) "Single-pole scaffold" means platforms resting on putlogs or cross beams, the outside ends of which are supported on ledgers secured to a single row or posts or uprights, and the inner ends of which are supported on or in a wall.

(k) "Stone setters' adjustable multiple-point suspension scaffold" means a swinging type scaffold having a platform supported by hangers suspended at four points so as to permit the raising or lowering of the platform to the desired working position by the use of hoisting machines.

(l) "Suspended scaffold" means a scaffold supported from above, the platform of which is supported at more than two points by steel wire cables suspended from overhead outriggers which are anchored to the steel or concrete frame of the building. It is equipped with a hoisting drum or machine so the platform can be raised or lowered.

(m) "Toeboard" means a standard toeboard and shall be 4 inches nominal in vertical height from its top edge to the level of the walking surface. It shall be securely fastened in place and have not more than 1/4-inch clearance above walking surface level. It may be made of any substantial material, either solid, or with openings not over 1 inch in greatest dimension.

(n) "Tube and coupler scaffold" means an assembly consisting of tubing which serves as posts, bearers, braces, ties, and runners, a base supporting the posts, and special couplers which serve to connect the uprights and to join the various members.

(o) "Tubular welded frame scaffold" means a sectional panel or frame metal scaffold substantially built up of prefabricated welded sections which consists of posts and horizontal bearer with intermediate members.

(p) "Two-point suspension scaffold (swinging scaffold)" means a scaffold, the platform of which is supported by hangers (stirrups) at two points, suspended from overhead supports so as to permit the raising or lowering of the platform to the desired working position by tackle or hoisting machines.

(q) "Window jack scaffold" means a scaffold, the platform of which is supported by a bracket or jack which projects through a window opening.

(r) "Working load" means the load imposed by persons, materials, and equipment.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-475, filed 1/21/86; Order 76-6, § 296-155-475, filed 3/1/76; Order 74-26, § 296-155-475, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-480 Ladders. (1) General requirements.**

All rules for design, construction, maintenance, operation, testing, and use of ladders contained in WAC 296-24-780 through 296-24-81013 of the general safety and health standards shall be complied with.

(a) Only Type I stepladders shall be used on construction worksites, except that painters may use Type II stepladders.

(b) Except where either permanent or temporary stairways or suitable ramps or runways are provided, ladders described in this Part shall be used to give safe access to all elevations.

(c) Ladders shall be maintained in good condition at all times.

(i) The joint between the steps and side rails shall be tight.

(ii) All hardware and fittings securely attached.

(iii) And the moveable parts shall operate freely without binding or undue play.

(iv) The use of ladders with broken or missing rungs or steps, broken or split side rails, or other faulty or defective construction is prohibited.

(v) When ladders with such defects are discovered, they shall be immediately withdrawn from service.

(vi) Inspection of metal ladders shall include checking for corrosion of interiors of open end hollow rungs.

(d) Manufactured portable wood ladders provided by the employer shall be in accordance with the provisions of the American National Standards Institute, A14.1-1982, Safety Code for Portable Wood Ladders.

(e) Portable metal ladders shall be of strength equivalent to that of wood ladders. Manufactured portable metal ladders provided by the employer shall be in accordance with the provisions of the American National Standards Institute, A14.2-1982, Safety Code for Portable Metal Ladders.

(f) Fixed ladders shall be in accordance with the provisions of the American National Standards Institute, A14.3-1984, Safety Code for Fixed Ladders.

(g) The feet of portable ladders shall be placed on a substantial base, and the area around the top and bottom of the ladder shall be kept clear. Safety feet shall be maintained to ensure proper working condition.

(h) Portable ladders shall be used at such a pitch that the horizontal distance from the top support to the foot of the ladder is about one-quarter of the working length of the ladder (the length along the ladder between the foot and the top support). Ladders shall not be used in a horizontal position as platforms, runways, or scaffolds.

(i) Ladders shall not be placed in passageways, doorways, driveways, or any location where they may be displaced by activities being conducted on any other work, unless protected by barricades or guards.

(j) The side rails shall extend not less than 36 inches above the landing. When this is not practical, grab rails, which provide a secure grip for an employee moving to or from the point of access, shall be installed.

(k) Portable straight ladders in use shall be tied, blocked, equipped with safety shoes or otherwise secured to prevent their being displaced.

(l) Portable metal ladders shall not be used for electrical work or where they may contact electrical conductors.

(m) Unless otherwise stated, all lumber sizes shall be nominal.

(n) When working from a ladder, the ladder shall be secured at both top and bottom.

(o) No type of work shall be performed on a ladder over 25 feet from the ground or floor that requires the use of both hands to perform the work, unless a safety belt is worn and the safety lanyard is secured to the ladder.

(p) Any work that requires wearing eye protection, respirators, or handling of pressure equipment, shall not be performed from a ladder more than twenty-five feet above the surrounding surface.

(q) Stepladders shall not be used as single ladders.

(r) Tops of ordinary types of stepladders shall not be used as steps.

(s) When working from a stepladder over five feet high a workman shall not stand on a step higher than the third step from the top of the stepladder.

(t) On two-section extension ladders the minimum overlap for the two sections shall be as follows:

Size of ladder expanded length (feet):	Overlap (feet)
Up to and including 36 _____	3
Over 36 up to and including 48 _____	4
Over 48 up to and including 60 _____	5

(u) Extension ladders shall always be erected so that the upper section is resting on the bottom section.

(v) When ascending or descending, the user shall face the ladder.

(w) Workmen shall not ascend or descend ladders while carrying tools or materials which might interfere with the free use of both hands.

(2) Job-made ladders.

(a) Job-made ladders shall be constructed for intended use.

(b) If a ladder is to provide the only means of access or exit from a working area for twenty-five or more employees, or simultaneous two-way traffic is expected, a double cleat ladder shall be installed.



(c) Double cleat ladders shall not exceed 24 feet in length.

(d) Single cleat ladders shall not exceed 30 feet in length between supports (base and top landing). If ladders are to connect different landings, or if the length required exceeds this maximum length, two or more separate ladders shall be used, offset with a platform between each ladder. Guardrails and toeboards shall be erected on the exposed sides of the platforms.

(e) The width of single cleat ladders shall be at least 15 inches, but not more than 20 inches between rails at the top.

(f) It is preferable that side rails be continuous. If splicing is necessary to attain the required length however, the splice must develop the full strength of a continuous side rail of the same length.

(g) 2-inch by 4-inch lumber shall be used for side rails of single cleat ladders up to 16 feet long; 2-inch by 6-inch lumber, or equivalent, shall be used for single cleat ladders from 16 to 30 feet in length.

(h) 2-inch by 4-inch lumber shall be used for side and middle rails of double cleat ladders up to 12 feet in length; 2-inch by 6-inch lumber for double cleat ladders from 12 to 24 feet in length.

(i) 1-inch by 4-inch lumber shall be used for cleats of single and double cleat ladders.

(j) Cleats shall be inset into the edges of the side rails one-half inch, or filler blocks shall be used on the rails between the cleats. The cleats shall be secured to each rail with three 10d common wire nails or other fasteners of equivalent strength. Cleats shall be uniformly spaced, 12 inches top-to-top.

(k) Side rails shall be parallel or flared top to bottom by not more than one-quarter of an inch for each 2 feet of ladder.

(l) Wood side rails of ladders having cleats shall be not less than 1-1/2 inches thick and 3-1/2 inches deep (2 inches by 4 inches nominal) when made of Group 2 or Group 3 woods (see Table J-18). Wood side rails of Group 4 wood (see Table J-18) may be used in the same cross-section of dimensions for cleat ladders up to 20 feet in length.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-480, filed 1/21/86. Statutory Authority: RCW 49.17.040, 49.17.150, and 49.17.240. 79-08-115 (Order 79-9), § 296-155-480, filed 7/31/79; Order 76-29, § 296-155-480, filed 9/30/76; Order 76-6, § 296-155-480, filed 3/1/76; Order 74-26, § 296-155-480, filed 5/7/74, effective 6/6/74.]

WAC 296-155-48090 Table J-18.

TABLE J-18

AVERAGE DENSITIES OF VARIOUS SPECIES OF WOOD FOR USE IN LADDERS

GROUP 1

Species	Density (lbs/ft)
White ash	41
Beech	43
Birch	44

Species	Density (lbs/ft)
Rock elm	43
Hickory	50
Locust	47
Hard maple	42
Red maple	36
Red oak	43
White oak	46
Pecan	46
Persimmon	50

GROUP 2

Douglas fir (coast region)	34
Western larch	38
Southern yellow pine	37

GROUP 3

Red alder	28
Oregon ash	38
Pumpkin ash	37
Alaska cedar	31
Port Orford cedar	30
Cucumber	34
Cypress	32
Soft elm	36
Douglas fir (Rocky Mountain type)	30
Noble fir	27
Gum	34
West Coast hemlock	30
Magnolia	35
Oregon maple	34
Norway pine	31
Poplar	28
Redwood	25
Eastern spruce	28
Sitka spruce	28
Sycamore	35
Tamarack	37
Tupelo	35

GROUP 4

Aspen	27
Basswood	25
Buckeye	25
Butternut	27
Incense cedar	25
Western red cedar	23
Black cottonwood	24
White fir	26
Hackberry	37
Eastern hemlock	28
Holly	39
Soft maple	33
Lodgepole pine	29



Species	Density (lbs/ft)
Idaho white pine . . . . .	28
Northern white pine . . . . .	25
Ponderosa pine . . . . .	28
Sugar pine . . . . .	26

[Order 76-29, Table J-18 (codified as WAC 296-155-48090), filed 9/30/76; Order 76-6, Table J-18, filed 3/1/76. Formerly 296-155-480 (part).]

**WAC 296-155-485 Scaffolding.** (1) General requirements. Scaffolds shall be furnished and erected in accordance with this standard for persons engaged in work that cannot be done safely from the ground or from solid construction, except that ladders used for such work shall conform to WAC 296-155-480 through 296-155-48090.

(a) All rules for design, construction, maintenance, operation, testing, and use of scaffolds contained in WAC 296-24-825 through 296-24-84013 apply within the construction industry.

(b) Scaffolds shall be erected in accordance with requirements of this section.

(c) The footing or anchorage for scaffolds shall be sound, rigid, and capable of carrying the maximum intended load without settling or displacement. Unstable objects such as barrels, boxes, loose brick, or concrete blocks, shall not be used to support scaffolds or planks.

(d) No scaffold shall be erected, moved, dismantled, or altered except under the supervision of competent persons.

(e) Standard guardrails and toeboards shall be installed on all open sides and ends of platforms more than 10 feet above the ground or floor, except needle beam scaffolds and floats. Scaffolds 4 feet to 10 feet in height, having a minimum horizontal dimension in either direction of less than 45 inches, shall have standard guardrails and toeboards installed on all open sides and ends of the scaffold platform.

(f) Where persons are required to work or pass under the scaffold, scaffolds shall be provided with a screen between the toeboard and the guardrail, extending along the entire opening, consisting of No. 18 gauge U.S. Standard wire 1/2-inch mesh, or the equivalent.

(g) Scaffolds and their components shall be capable of supporting without failure at least 4 times the maximum intended load.

(h) Any scaffold including accessories such as braces, brackets, trusses, screw legs, ladders, etc. damaged or weakened from any cause shall be immediately repaired or replaced.

(i) All load-carrying timber members of scaffold framing shall be a minimum of 1,500 fiber (stress grade) construction grade lumber. All dimensions are nominal sizes as provided in the American Lumber Standards, except that where rough sizes are noted, only rough or undressed lumber of the size specified will satisfy minimum requirements.

(j) All planking shall be scaffold grades, or equivalent, as recognized by approved grading rules for the species of wood used. The maximum permissible spans for 2- x 10-inch or wider planks shall be as shown in Table J-1.

(k) The maximum permissible span for 1 1/4- x 9-inch or wider plank of full thickness shall be 4 feet with medium duty loading of 50 p.s.f.

(l) Platforms shall be level. All planking or platforms shall be overlapped (minimum 12 inches), or secured from movement. The platform shall be a minimum of two 2-inch by 10-inch planks in width or a minimum of 18 inches.

(m) An access ladder or equivalent safe access shall be provided.

(n) Scaffold planks shall extend over their end supports not less than 6 inches nor more than 12 inches.

(o) The poles, legs, or uprights of scaffolds shall be plumb, and securely and rigidly braced to prevent swaying and displacement.

(p) Overhead protection shall be provided for persons on a scaffold exposed to overhead hazards.

(q) Slippery conditions on scaffolds shall be eliminated as soon as possible after they occur.

(r) No welding, burning, riveting, or open flame work shall be performed on any staging suspended by means of fiber or synthetic rope. Only treated or protected fiber or synthetic ropes shall be used for or near any work involving the use of corrosive substances or chemicals. Specific requirements for boatswain's chairs and float or ship scaffolds are contained in subsections (12) and (23) of this section.

(s) Wire, synthetic, or fiber rope used for scaffold suspension shall be capable of supporting at least 6 times the rated load.

(t) The use of shore or lean-to scaffolds is prohibited.

(u) The height of freestanding scaffold towers shall not exceed four times the minimum base dimension.

(2) Wood pole scaffolds.

(a) Scaffold poles shall bear on a foundation of sufficient size and strength to spread the load from the pole over a sufficient area to prevent settlement. All poles shall be set plumb.

(b) Where wood poles are spliced, the ends shall be squared and the upper section shall rest squarely on the lower section. Wood splice plates shall be provided on at least two adjacent sides and shall be not less than 4 feet in length, overlapping the abutted ends equally, and have the same width and not less than the cross-sectional area of the pole. Splice plates or other materials of equivalent strength may be used.

(c) Independent pole scaffolds shall be set as near to the wall of the building as practicable.

(d) All pole scaffolds shall be securely guyed or tied to the building or structure. Where the height or length exceeds 25 feet, the scaffold shall be secured at intervals not greater than 25 feet vertically and horizontally.

(e) Putlogs or bearers shall be set with their greater dimension vertical, and long enough to project over the ledgers of the inner and outer rows of poles at least 3 inches for proper support.

(f) Every wooden putlog on single pole scaffolds shall be reinforced with a 3/16- x 2-inch steel strip, or equivalent, secured to its lower edge throughout its entire length.

(g) Ledgers shall be long enough to extend over two pole spaces. Ledgers shall not be spliced between the poles. Ledgers shall be reinforced by bearing blocks securely nailed to the side of the pole to form a support for the ledger.

(h) Diagonal bracing shall be provided to prevent the poles from moving in a direction parallel with the wall of the building, or from buckling.

(i) Cross bracing shall be provided between the inner and outer sets of poles in independent pole scaffolds. The free ends of pole scaffolds shall be cross braced.

(j) Full diagonal face bracing shall be erected across the entire face of pole scaffolds in both directions. The braces shall be spliced only at the poles. The inner row of poles on medium and heavy duty scaffolds shall be braced in a similar manner.

(k) Platform planks shall be laid with their edges close together so the platform will be tight with no spaces through which tools or fragments of material can fall.

(l) Where planking is lapped, each plank shall lap its end supports at least 12 inches. Where the ends of planks abut each other to form a flush floor, the butt joint shall be at the centerline of a pole. The abutted ends shall rest on separate bearers. Intermediate beams shall be provided where necessary to prevent dislodgment of planks due to deflection, and the ends shall be secured to prevent their dislodgment.

(m) When a scaffold materially changes its direction, the platform planks shall be laid to prevent tipping. The planks that meet the corner putlog at an angle shall be laid first, extending over the diagonally placed putlog far enough to have a good safe bearing, but not far enough to involve any danger from tipping. The planking running in the opposite direction at an angle shall be laid so as to extend over and rest on the first layer of planking.

(n) When moving platforms to the next level, the old platform shall be left undisturbed until the new putlogs or bearers have been set in place, ready to receive the platform planks.

(o) All wood pole scaffolds 60 feet or less in height shall be constructed and erected in accordance with Tables J-2 to J-8. If they are over 60 feet in height, they shall be designed by a qualified engineer competent in this field, and shall be constructed and erected in accordance with such design. Design drawings shall be available at the jobsite.

### (3) Tube and coupler scaffolds.

(a) A light duty tube and coupler scaffold shall have all posts, bearers, runners, and bracing of nominal 2-inch O.D. steel tubing. The posts shall be spaced no more than 6 feet apart by 10 feet along the length of the scaffold. Other structural metals when used must be designed to carry an equivalent load. No dissimilar metals shall be used together.

(b) A medium duty tube and coupler scaffold shall have all posts, runners, and bracing of nominal 2-inch

O.D. steel tubing. Posts spaced not more than 6 feet apart by 8 feet along the length of the scaffold shall have bearers of nominal 2 1/2-inch O.D. steel tubing. Posts spaced not more than 5 feet apart by 8 feet along the length of the scaffold shall have bearers of nominal 2-inch O.D. steel tubing. Other structural metals, when used, must be designed to carry an equivalent load. No dissimilar metals shall be used together.

(c) A heavy duty tube and coupler scaffold shall have all posts, runners, and bracing of nominal 2-inch O.D. steel tubing, with the posts spaced not more than 6 feet by 6 feet-6 inches. Other structural metals, when used, must be designed to carry an equivalent load. No dissimilar metals shall be used together.

(d) Tube and coupler scaffolds shall be limited in heights and working levels to those permitted in Tables J-8, J-9 and J-10. Drawings and specifications of all tube and coupler scaffolds above the limitations in Tables J-8, J-9 and J-10 shall be designed by a qualified engineer competent in this field. Design drawings shall be available at the jobsite.

(e) All tube and coupler scaffolds shall be constructed and erected to support four times the maximum intended loads, as set forth in Tables J-8, J-9 and J-10, or as set forth in the specifications by a licensed professional engineer competent in this field.

(f) Posts shall be accurately spaced, erected on suitable bases, and maintained plumb.

(g) Runners shall be erected along the length of the scaffold, located on both the inside and the outside posts at even height. Runners shall be interlocked to the inside and the outside posts at even heights. Runners shall be interlocked to form continuous lengths and coupled to each post. The bottom runners shall be located as close to the base as possible. Runners shall be placed not more than 6 feet-6 inches on centers. When tube and coupler guardrails and midrails are used on outside posts, they may be used in lieu of outside runners.

(h) Bearers shall be installed transversely between posts and shall be securely coupled to the posts with the inboard coupler bearing on the runner coupler. Where guardrails and midrails are required, no outboard runner is required.

(i) The length of the bearer shall exceed the post spacing of the width of the scaffold by the amount necessary to have full contact with the coupler. Bearers used to provide a cantilever support for use as brackets for light and medium-duty scaffolds shall not carry more than two ten-inch planks unless knee braced.

(j) Bracing across the width of the scaffold shall be installed at the ends of the scaffold at least at every fourth level. Such bracing shall extend diagonally from the outer post or runner at this level upward to the inner post or runner at the next level.

(k) Longitudinal diagonal bracing shall be installed on the outer rows of poles at approximately forty degrees to fifty degrees angle from near the base of the first and last outer post upward to the top center of the scaffold. If the scaffold is long, the above diagonal bracing shall be repeated. On short but high runs, the diagonal bracing shall be installed at forty degrees to fifty degrees

from the base of the first outer post to the last outer post alternating directions to the top of the scaffold. When conditions preclude the attachment of this bracing to the posts, it may be attached to the runners.

(l) When a scaffold exceeds either 30 feet horizontally or 26 feet vertically, the entire scaffold shall be tied to and securely braced against the building at intervals not to exceed 30 feet horizontally and 26 feet vertically.

(4) Fabricated tubular welded frame scaffolds.

(a) Metal tubular frame scaffolds, including accessories such as braces, brackets, trusses, screw legs, ladders, etc., shall safely support four times the maximum rated load. The maximum rated load shall not be exceeded.

(b) Spacing of panels or frames shall be consistent with the loads imposed.

(c) Scaffolds shall be properly braced by cross bracing or diagonal braces, or both, for securing vertical members together laterally, and the cross braces shall be of such length as will automatically square and aline vertical members so that the erected scaffold is always plumb, level, square, and rigid. All brace connections shall be made secure.

(d) Panel or frame legs shall be set on adjustable bases or plain bases placed on mud sills or other foundations adequate to support the maximum rated load.

(e) The panels or frames shall be placed one on top of the other with coupling or stacking pins to provide proper vertical alinement of the legs.

(f) Where uplift may occur, panels shall be locked together vertically by pins or equivalent method.

(g) To prevent movement, the scaffold shall be secured to the building or structure at intervals not to exceed 30 feet horizontally and 26 feet vertically.

(h) Maximum permissible spans or planking shall be in conformity with (1)(j) of this section.

(i) Fabricated tubular frame scaffolds over 125 feet in height above the base plates shall be designed by a registered professional engineer. Copies of the drawings and specifications shall be available at the jobsite.

(j) Guardrails, midrails, and toeboards shall be installed as required by subsection (1)(e) of this section. Wire mesh shall be provided between the toprail and toeboard when persons are working below.

(k) All fabricated tubular frame scaffolds shall be erected by competent and experienced personnel.

(l) All brackets shall be seated correctly with side brackets parallel to the frames and end brackets at ninety degrees to the frames. Brackets shall not be bent or twisted from normal position. Brackets (except mobile brackets designed to carry materials) are to be used as work platforms only and shall not be used for storage of material or equipment.

(m) Scaffold frames and their components manufactured by different companies shall not be intermixed unless they are compatible and the manufacturer has given written approval. The manufacturer's letter of approval shall be available at the jobsite.

(n) Periodic inspections by the employer shall be made of all fabricated tubular frames and accessories. Any maintenance required shall be made before further use.

(5) Outrigger scaffolds, general.

(a) Outrigger beams shall extend not more than 6 feet beyond the face of the building. The inboard end of outrigger beams, measured from the fulcrum point to the inboard point of support, shall be not less than 1 1/2 times the outboard end in length. The beams shall rest on edge, the sides shall be plumb, and the edges shall be horizontal. The fulcrum point of the beam shall rest on a secure bearing at least 6 inches in each horizontal dimension. The beam shall be secured in place against movement and shall be securely braced at the fulcrum point against tipping.

(b) The inboard ends of outrigger beams shall be positively secured either by means of struts bearing against sills in contact with the overhead beams or ceiling, or by means of tension members secured to the floor joists underfoot, or by both if necessary, or by a securely fastened solid body counterweight. (Water in an open container or loose material in bags shall not be permitted.) The inboard ends of outrigger beams shall be secured against tipping and the entire supporting structure shall be securely braced in both directions to prevent any horizontal movement.

(c) Unless outrigger scaffolds are designed by a registered professional engineer competent in this field, they shall be constructed and erected in accordance with Table J-11. Outrigger scaffolds, designed by a registered professional engineer, shall be constructed and erected in accordance with such design. A copy of the drawings and specifications shall be available at the jobsite.

(d) Planking shall be laid tight and shall extend to within 3 inches of the building wall. Planking shall be secured to the beams.

(6) Masons' adjustable multiple-point suspension scaffolds.

(a) The scaffold shall be capable of sustaining a working load of 50 pounds per square foot and shall not be loaded in excess of that figure.

(b) The scaffold shall be provided with hoisting machines that meet the requirements of Underwriters' Laboratories, Factory Mutual Engineering Corporation, or other agency or laboratory approved by the department of labor and industries.

(c) The platform shall be supported by wire ropes, capable of supporting at least 6 times the intended load, suspended from overhead outrigger beams.

(d) The scaffold outrigger beams shall consist of structural metal securely fastened or anchored to the frame or floor system of the building or structure.

(e) Each outrigger beam shall be equivalent in strength to at least a standard 7-inch, 15.3-pound steel I-beam, at least 15 feet long, and shall not project more than 6 feet 6 inches beyond the bearing point.

(f) Where the overhang exceeds 6 feet 6 inches, outrigger beams shall be composed of stronger beams or multiple beams and be installed under the supervision of a competent person.

(g) All outrigger beams shall be set and maintained with their webs in a vertical position.

(h) A stop bolt shall be placed at each end of every outrigger beam.

(i) The outrigger beam shall rest on suitable wood bearing blocks.

(j) The free end of the suspension wire ropes shall be equipped with proper size thimbles and secured by splicing or other equivalent means. The running ends shall be securely attached to the hoisting drum. At least four turns of wire rope shall remain on the drum when the platform is at ground level. The use of fiber rope is prohibited.

(k) Where a single outrigger beam is used, the steel shackles or clevises with which the wire ropes are attached to the outrigger beams shall be placed directly over the hoisting drums.

(l) The scaffold platform shall be equivalent in strength to at least 2-inch planking. (For maximum planking spans, see subsection (1)(j) of this section.)

(m) When employees are at work on the scaffold and an overhead hazard exists, overhead protection shall be provided on the scaffold, not more than 9 feet above the platform, consisting of 2-inch planking, or material of equivalent strength, laid tight, and extending not less than the width of the scaffold.

(n) Each scaffold shall be installed or relocated under the supervision of a competent person.

(o) When channel iron outrigger beams are used instead of I-beams, they shall be securely fastened together with the flanges turned out.

(p) All parts of the scaffold, such as bolts, nuts, fittings, clamps, wire rope, outrigger beams and their fastenings shall be maintained in sound condition and shall be inspected before each installation and periodically thereafter. All parts shall be of the grade specified by the manufacturer.

(7) Two-point suspension scaffolds.

(a) Two-point suspension scaffold platforms shall be not less than 20 inches nor more than 36 inches wide overall. The platform shall be securely fastened to the hangers by U-bolts or by other equivalent means.

(b) The hangers of two-point suspension scaffolds shall be made of wrought iron, mild steel, or other equivalent material, having a cross-sectional area capable of sustaining 4 times the maximum rated load, and shall be designed with a support for guardrail, intermediate rail, and toeboard.

(c) When hoisting machines are used on two-point suspension scaffolds, such machines shall be of a design tested and approved by Underwriters' Laboratories, Factory Mutual Engineering Corporation, or by an agency or laboratory approved by the department of labor and industries.

(d) The roof irons or hooks shall be of mild steel, or other equivalent material, of proper size and design, securely installed and anchored. The roof irons or hooks and any other devices shall have tiebacks of 3/4-inch manila rope, or the equivalent, to serve as a secondary means of anchorage, installed at right angles to the face of the building, whenever possible, and secured to a structurally sound portion of the building.

(e) Two-point suspension scaffolds shall be suspended by wire, synthetic or fiber ropes capable of supporting at least 6 times the rated load. All other components shall

be capable of supporting at least four times the rated load.

(f) The sheaves of all blocks, consisting of at least one double and one single block, shall fit the size and type of rope used and shall be a minimum of six inches in diameter.

(g) All wire ropes, fiber and synthetic ropes, slings, hangers, platforms, and other supporting parts shall be inspected before every installation. Periodic inspections shall be made while the scaffold is in use.

(h) On suspension scaffolds designed for a working load of 500 pounds, no more than two persons shall be permitted to work at one time. On suspension scaffolds with a working load of 750 pounds, no more than three persons shall be permitted to work at one time. On suspension scaffolds with a working load of 1,000 pounds, no more than four persons shall be permitted to work at one time. Each employee shall be protected by an approved safety life belt attached to a dropline. The droplines shall be securely attached to substantial members of the structure (not scaffold), or to securely rigged lines, which will safely suspend the employee in case of a fall. In order to keep the dropline continuously attached, with a minimum of slack, to a fixed structure, the attachment point of the dropline shall be appropriately changed as the work progresses.

(i) When a multi-tiered two-point suspension scaffold is used, it shall be provided with safety droplines that attach to each end of the scaffold through an approved quick acting safety device, in case either or both of the main suspension lines should break. The lanyard of the safety belt shall be tied off to a substantial member of the scaffold itself or to a horizontal lifeline attached to each end of the scaffold or a sliding device on the horizontal lifeline. The two additional safety droplines shall be individually suspended from roof irons, hooks, or other approved devices and shall be near the suspension droplines to prevent unnecessary side impact. The safety dropline shall have a 6 to 1 safety factor. Such scaffolds shall be designed by a licensed professional engineer and a copy of the drawings and specifications shall be available at the jobsite.

(j) Two-point suspension scaffolds shall be securely lashed to the building or structure to prevent the scaffolds from swaying. Window cleaners' anchors shall not be used for this purpose.

(k) The platform of every two-point suspension scaffold shall be one of the following types:

(i) Ladder-type platforms. The side stringer shall be of clear straight-grained spruce or materials of equivalent strength and durability. The rungs shall be of straight-grained oak, ash, or hickory, at least 1 1/8 inch in diameter, with 7/8-inch tenons mortised into the side stringers at least 7/8-inch. The stringers shall be tied together with the tie rods not less than one-quarter inch in diameter, passing through the stringers and riveted up tight against washers on both ends. The flooring strips shall be spaced not more than five-eighths inch apart except at the side rails where the space may be 1 inch. Ladder-type platforms shall be constructed in accordance with Table J-12.

(ii) Plank-type platforms. Plank-type platforms shall be composed of not less than two nominal 2- x 10-inch unspliced planks, properly cleated together on the underside, starting 6 inches from each end; intervals in between shall not exceed 4 feet. The plank-type platform shall not extend beyond the hangers more than 12 inches. A bar or other effective means shall be securely fastened to the platform at each end to prevent its slipping off the hanger. The span between hangers for plank-type platforms shall not exceed 8 feet.

(iii) Beam-type platforms. Beam platforms shall have side stringers of lumber not less than 2 x 6 inches set on edge. The span between hangers shall not exceed 12 feet when beam platforms are used. The flooring shall be supported on 2- x 6-inch cross beams, laid flat and set into the upper edge of the stringers with a snug fit, at intervals of not more than 4 feet, securely nailed in place. The flooring shall be of 1- x 6-inch material properly nailed. Floor boards shall not be spaced more than one-half inch apart.

(iv) Light metal-type platforms, when used, shall be tested and listed according to Underwriters' Laboratories, Factory Mutual Engineering Corporation, or the department of labor and industries.

(l) In addition to the normal operating brake, all power-driven units shall have an emergency brake which engages automatically when the normal speed of descent is exceeded.

(m) When acid solutions are used, natural or synthetic fiber rope shall not be used.

(n) Every swinging scaffold shall be tested before using by raising the platform one foot from the ground and loading it with at least four times the maximum weight to be imposed when aloft.

(8) Stone setters' adjustable multiple-point suspension scaffolds.

(a) The scaffold shall be capable of sustaining a working load of 25 pounds per square foot and shall not be overloaded. Scaffolds shall not be used for storage of stone or other heavy materials.

(b) When used, the hoisting machine and its supports shall be of a type tested and listed by Underwriters' Laboratories, Factory Mutual Engineering Corporation or the department of labor and industries.

(c) The platform shall be securely fastened to the hangers by U-bolts or other equivalent means. (For materials and spans, see item (ii) of subsection (7)(k), Plank-type Platforms and Table J-12 of this section.)

(d) The scaffold unit shall be suspended from metal outriggers, iron brackets, wire rope slings, or iron hooks.

(e) Outriggers, when used, shall be set with their webs in a vertical position, securely anchored to the building or structure and provided with stop bolts at each end.

(f) The scaffold shall be supported by wire rope capable of supporting at least 6 times the rated load. All other components shall be capable of supporting at least 4 times the rated load.

(g) The free ends of the suspension wire ropes shall be equipped with proper size thimbles, secured by splicing or other equivalent means. The running ends shall be

securely attached to the hoisting drum and at least four turns of wire rope shall remain on the drum at all times.

(h) When two or more scaffolds are used on a building or structure, they shall not be bridged one to the other; but shall be maintained at even height with platforms abutting closely.

(i) In addition to the normal operating brake, all power-driven units shall have an emergency brake which engages automatically when the normal speed of descent is exceeded.

(j) Each scaffold shall be installed or relocated in accordance with approved designs and instructions under the supervision of a competent designated person.

(k) Where additional working levels are required to be supported, the plans and specifications of the support and scaffold components shall be designed by a licensed professional engineer. These plans and specifications shall be available at the site.

(9) Single-point adjustable suspension scaffolds.

(a) The scaffolding, including power units or manually operated winches, shall be of a type tested and listed by Underwriters' Laboratories, Factory Mutual Engineering Corporation or the department of labor and industries.

(b) The power units may be either electrically or air motor driven.

(c) All power-operated gears and brakes shall be enclosed.

(d) In addition to the normal operating brake, all power-driven units shall have an emergency brake which engages automatically when the normal speed of descent is exceeded.

(e) The hoisting machines, cables, and equipment shall be regularly serviced and inspected.

(f) The units may be combined to form a two-point suspension scaffold. Such scaffold shall comply with subsection (7) of this section.

(g) When the supporting wire rope is not plumb for its entire length, supports shall be designed to sustain any additional load or stress upon the line.

(h) Suspension methods and employee safeguards shall conform to the provisions of subsections (6) and (7) of this section.

(i) For additional details not covered in this subsection applicable technical portions of American National Standards Institute, A120.1-1970, Power-Operated Devices for Exterior Building Maintenance Powered Platforms, shall be used.

(10) Boatswain's chairs.

(a) The chair seat shall not be less than 12 x 24 inches, and 1-inch thick. The seat shall be reinforced on the underside by cleats securely fastened to prevent the board from splitting. Specially designed seats having dimensions other than those specified in this subsection may be used provided they have been designed and tested (with a safety factor of four) to sustain a load of two hundred fifty pounds.

(b) The two fiber rope seat slings shall be of 5/8-inch diameter, reeved through the four seat holes so as to cross each other on the underside of the seat.

(c) Seat slings shall be of at least 3/8-inch wire rope when an employee is conducting a heat-producing process, such as gas welding.

(d) The employee shall be protected by a safety belt and lifeline in accordance with WAC 296-155-225. The attachment point of the lifeline to the structure shall be appropriately changed as the work progresses.

(e) The tackle shall consist of correct size ball bearing or bushed blocks and properly spliced 5/8-inch diameter first grade manila rope, or equivalent.

(f) The roof irons, hooks, or the object to which the tackle is anchored, shall be securely installed. Tiebacks, when used, shall be installed at right angles to the face of the building and securely fastened.

(g) The scaffolding, including power units shall be of tested design.

(h) All power operated gears and brakes shall be enclosed.

(i) In addition to the normal operating brake, all power-driven units shall have an emergency brake which engages automatically when the normal speed of descent is exceeded.

(11) Carpenters' bracket scaffolds.

(a) The brackets shall consist of a triangular wood frame not less than 2 x 3 inches in cross section, or of metal of equivalent strength. Each member shall be properly fitted and securely joined.

(b) Each bracket shall be attached to the structure by means of one of the following:

(i) A bolt, no less than 5/8-inch in diameter, which shall extend through to the inside of the building wall;

(ii) A metal stud attachment device;

(iii) Welding to steel tanks;

(iv) Hooking over a well-secured and adequately strong supporting member.

(c) The brackets shall be spaced no more than 8 feet apart.

(d) No more than two employees shall occupy any given 8 feet of a bracket scaffold at any one time. Tools and materials shall not exceed 75 pounds in addition to the occupancy.

(e) The platform shall consist of not less than two 2- x 10-inch planks extending not more than 12 inches or less than 6 inches beyond each end support. Fabricated planking may be used if properly engineered and tested.

(12) Bricklayers' square scaffolds.

(a) The squares shall not exceed 5 feet in width and 5 feet in height.

(b) Members shall be not less than those specified in Table J-13.

(c) The squares shall be reinforced on both sides of each corner with 1- x 6-inch gusset pieces. They shall also have diagonal braces 1 x 8 inches on both sides running from center to center of each member, or other means to secure equivalent strength and rigidity.

(d) The squares shall be set not more than 5 feet apart for medium duty scaffolds, and not more than 8 feet apart for light duty scaffolds. Bracing, 1 x 8 inches, extending from the bottom of each square to the top of

the next square, shall be provided on both front and rear sides of the scaffold.

(e) Platform planks shall be at least 2 x 10-inch. The ends of the planks shall overlap the bearers of the squares and each plank shall be supported by not less than three squares. Fabricated planking may be used if properly engineered and tested.

(f) Bricklayers' square scaffolds shall not exceed three tiers in height and shall be so constructed and arranged that one square shall rest directly above the other. The upper tiers shall stand on a continuous row of planks laid across the next lower tier and be nailed down or otherwise secured to prevent displacement.

(g) Scaffolds shall be level and set upon a firm foundation.

(13) Horse scaffolds.

(a) Horse scaffolds shall not be constructed or arranged more than two tiers or 10 feet in height.

(b) The members of the horses shall be not less than those specified in Table J-14.

(c) Horses shall be spaced not more than 5 feet for medium duty and not more than 8 feet for light duty.

(d) When arranged in tiers, each horse shall be placed directly over the horse in the tier below.

(e) On all scaffolds arranged in tiers, the legs shall be nailed down or otherwise secured to the planks to prevent displacement or thrust and each tier shall be substantially cross braced.

(f) Horses or parts which have become weak or defective shall not be used.

(14) Needle beam scaffold.

(a) Wood needle beams shall be not less than 4 x 6 inches in size, with the greater dimension placed in a vertical direction. Metal beams or the equivalent, conforming to subsections (1)(h) and (j) of this section, may be used and shall not be altered or moved horizontally while they are in use.

(b) Ropes or hangers shall be provided for supports. The span between supports on the needle beam shall not exceed 10 feet for 4- x 6-inch timbers. Rope supports shall be equivalent in strength to 1-inch diameter first-grade manila rope.

(c) The ropes shall be attached to the needle beams by a scaffold hitch or a properly made eye splice. The loose end of the rope shall be tied by a bowline knot or by a round turn and a half hitch.

(d) The scaffold hitch shall be arranged so as to prevent the needle beam from rolling or becoming otherwise displaced.

(e) The platform span between the needle beams shall not exceed 8 feet when using 2-inch scaffold plank. For spans greater than 8 feet, platforms shall be designed based on design requirements for the special span. The overhang of each end of the platform planks shall be not less than 6 inches and not more than 12 inches.

(f) When needle beam scaffolds are used, the planks shall be secured against slipping.

(g) All unattached tools, bolts, and nuts used on needle beam scaffolds shall be kept in suitable containers, properly secured.



(h) One end of a needle beam scaffold may be supported by a permanent structural member conforming to subsections (1)(h) and (j) of this section.

(i) Each employee working on a needle beam scaffold shall be protected by a safety belt and lifeline in accordance with WAC 296-155-225.

(15) Plasterers', decorators', and large area scaffolds.

(a) Plasters', lathers', and ceiling workers' inside scaffolds shall be constructed in accordance with the general requirements set forth for independent wood pole scaffolds. (See subsection (2) of this section and Tables J-5, J-6 and J-7.)

(b) All platform planks shall be laid with the edges close together.

(c) When independent pole scaffold platforms are erected in sections, such sections shall be provided with connecting runways equipped with substantial guardrails.

(16) Interior hung scaffolds.

(a) An interior hung scaffold shall be hung or suspended from the roof structure or ceiling beams.

(b) The suspending wire or fiber rope shall be capable of supporting at least 6 times the rated load. The rope shall be wrapped at least twice around the supporting members and twice around the bearers of the scaffold, with each end of the wire rope secured by at least three standard wire-rope clips properly installed.

(c) For hanging wood scaffolds, the following minimum nominal size material shall be used:

(i) Supporting bearers 2 x 10 inches on edge;

(ii) Planking 2 x 10 inches, with maximum span 7 feet for heavy duty and 10 feet for light duty or medium duty.

(d) Steel tube and coupler members may be used for hanging scaffolds with both types of scaffold designed to sustain a uniform distributed working load up to heavy duty scaffold loads with a safety factor of four.

(e) All overhead supporting members shall be inspected and have required strength assured before the scaffold is erected.

(17) Ladder jack scaffolds.

(a) All ladder jack scaffolds shall be limited to light duty and shall not exceed a height of 20 feet above the floor or ground.

(b) All ladders used in connection with ladder jack scaffolds shall be Type I heavy-duty ladders and shall be designed and constructed in accordance with American National Standards Institute A14.1-1982, Safety Code for Portable Wood Ladders, and A14.2-1982, Safety Code for Portable Metal Ladders. Cleated ladders shall not be used for this purpose.

(c) The ladder jack shall be so designed and constructed that it will bear on the side rails in addition to the ladder rungs, or if bearing on rungs only, the bearing area shall be at least 10 inches on each rung.

(d) Ladders used in conjunction with ladder jacks shall be so placed, fastened, held, or equipped with devices so as to prevent slipping.

(e) The wood platform planks shall be not less than 2 inches in thickness. Both metal and wood platform planks shall overlap the bearing surface not less than 12

inches and shall be secured to prevent movement. The span between supports for wood shall not exceed 8 feet. Platform width shall be not less than 18 inches.

(f) No more than two persons shall be within any 8 feet section of any ladder jack scaffold at any one time. When the use of standard guardrails as required by subsection (1)(e) of this section is impractical, safety belts and lifelines shall be used in accordance with WAC 296-155-225.

(18) Window jack scaffolds.

(a) Window jack scaffolds shall be used only for the purpose of working at the window opening through which the jack is placed.

(b) Window jacks shall not be used to support planks placed between one window jack and another or for other elements of scaffolding.

(c) Window jack scaffolds shall be provided with guardrails unless safety belts with lifelines are attached and used by the employee.

(d) Not more than one employee shall occupy a window jack scaffold at any one time.

(e) Window jacks shall be designed and constructed so as to provide a secure anchorage on the window opening and be capable of supporting the design load.

(19) Roofing brackets.

All roofing brackets must be installed and used in accordance with the requirements of WAC 296-155-50503(1).

(20) Crawling boards or chicken ladders.

All crawling boards or chicken ladders shall be installed and used in accordance with the requirements of WAC 296-155-50503(2).

(21) Float or ship scaffolds.

(a) Float or ship scaffolds shall not be used to support more than three persons and a few light tools, such as those needed for riveting, bolting, and welding. They shall be constructed as designed in subdivisions (b) through (f) of this subsection, unless substitute designs and materials provide equivalent strength, stability, and safety.

(b) The platform shall be not less than 3 feet wide and 6 feet long, made of 3/4-inch plywood, equivalent to American Plywood Association Grade B-B, Group I, Exterior, or other similar material.

(c) Under the platform, there shall be two supporting bearers made from 2- x 4-inch, or 1- x 10-inch rough, "selected lumber," or better. They shall be free of knots or other flaws and project 6 inches beyond the platform on both sides. The ends of the platform shall extend 6 inches beyond the outer edges of the bearers. Each bearer shall be securely fastened to the platform.

(d) An edging of wood not less than 3/4 x 1 1/2 inches or equivalent shall be placed around all sides of the platform to prevent tools from rolling off.

(e) Supporting ropes shall be 1-inch diameter manila rope or equivalent, free from deterioration, chemical damage, flaws, or other imperfections. Rope connections shall be such that the platform cannot shift or slip. If two ropes are used with each float, they shall be arranged so as to provide four ends which are to be securely fastened to an overhead support. Each of the



two supporting ropes shall be hitched around one end of bearer and pass under the platforms to the other end of the bearer where it is hitched again, leaving sufficient rope at each end for the supporting ties.

(f) Each employee shall be protected by an approved safety lifebelt and lifeline, in accordance with WAC 296-155-225.

(22) Form scaffolds.

(a) Form scaffolds shall be constructed of wood or other suitable materials, such as steel or aluminum members of known strength characteristics. All scaffolds shall be designed and erected with a minimum safety factor of 4, computed on the basis of the maximum rated load.

(b) All scaffold planking shall be a minimum of 2- x 10-inch nominal Scaffold Grade, as recognized by approved grading rules for the species of lumber used, or equivalent material. Maximum permissible spans shall not exceed 8 feet on centers for 2- x 10-inch nominal planking. Scaffold planks shall be either nailed or bolted to the ledgers or of such length that they overlap the ledgers at least 6 inches. Unsupported projecting ends of scaffolding planks shall be limited to a maximum overhang of 12 inches.

(c) Scaffolds shall not be loaded in excess of the working load for which they were designed.

(d) Figure-four form scaffolds:

(i) Figure-four scaffolds are intended for light duty and shall not be used to support loads exceeding 25 pounds per square foot unless specifically designed for heavier loading. For minimum design criteria, see Table J-15.

(ii) Figure-four form scaffold frames shall be spaced not more than 8 feet on centers and constructed from sound lumber, as follows: The outrigger ledger shall consist of two pieces of 1- x 6-inch or heavier material nailed on opposite sides of the vertical form support. Ledgers shall project not more than 3 feet 6 inches from the outside of the form support and shall be substantially braced and secured to prevent tipping or turning. The knee or angle brace shall intersect the ledger at least 3 feet from the form at an angle of approximately 45°, and the lower end shall be nailed to a vertical support. The platform shall consist of two or more 2- x 10-inch planks, which shall be of such length that they extend at least 6 inches beyond ledgers at each end unless secured to the ledgers. When planks are secured to the ledgers (nailed or bolted), a wood filler strip shall be used between the ledgers. Unsupported projecting ends of planks shall be limited to an overhang of 12 inches.

(e) Metal bracket form scaffolds:

(i) Metal brackets or scaffold jacks which are an integral part of the form shall be securely bolted or welded to the form. Folding type brackets shall be either bolted or secured with a locking-type pin when extended for use.

(ii) "Clip-on" or "hook-over" brackets may be used, provided the form walers are bolted to the form or secured by snap ties or shea-bolt extending through the form and securely anchored.

(iii) Metal brackets shall be spaced not more than 8 feet on centers.

(iv) Scaffold planks shall be either bolted to the metal brackets or of such length that they overlap the brackets at each end by at least 6 inches. Unsupported projecting ends of scaffold planks shall be limited to a maximum overhang of 12 inches.

(v) Metal bracket form scaffolds shall be equipped with wood guardrails, intermediate rails, toeboards, and scaffold planks meeting the minimum dimensions shown in Table J-16. (Metal may be substituted for wood, providing it affords equivalent or greater design strength.)

(f) Wooden bracket form scaffolds:

(i) Wooden bracket form scaffolds shall be an integral part of the form panel. The minimum design criteria set forth herein and in Table J-17 cover scaffolding intended for light duty and shall not be used to support loads exceeding 25 pounds per square foot, unless specifically designed for heavier loading.

(ii) Scaffold planks shall be either nailed or bolted to the ledgers or of such length that they overlap the ledgers at each end by at least 6 inches. Unsupported projecting ends of scaffold planks shall be limited to a maximum overhang of 12 inches.

(23) Pump jack scaffolds.

(a) Pump jack scaffolds shall:

- (i) Not carry a working load exceeding 500 pounds;
- (ii) Be capable of supporting without failure at least four times the maximum intended load; and
- (iii) Shall not have components loaded in excess of the manufacturer's recommended limits.

(b) Pump jack brackets, braces, and accessories shall be fabricated from metal plates and angles. Each pump jack bracket shall have two positive gripping mechanisms to prevent any failure or slippage.

(c) The platform bracket shall be fully docked and the planking secured. Planking, or equivalent, shall conform with subsection (1) of this section.

(d)(i) When wood scaffold planks are used as platforms, poles used for pump jacks shall not be spaced more than 10 feet center to center. When fabricated platforms are used that fully comply with all other provisions of this subsection, pole spacing may exceed 10 feet center to center.

(ii) Poles shall not exceed 30 feet in height.

(iii) Poles shall be secured to the work wall by rigid triangular bracing, or equivalent, at the bottom, top, and other points as necessary, to provide a maximum vertical spacing of not more than 10 feet between braces. Each brace shall be capable of supporting a minimum of 225 pounds tension or compression.

(iv) For the pump jack bracket to pass bracing already installed, an extra brace shall be used approximately 4 feet above the one to be passed until the original brace is reinstalled.

(e) All poles shall bear on mud sills or other adequate firm foundations.

(f) Pole lumber shall be two 2 x 4's, of Douglas fir or equivalent, straight-grained, clear, free of cross-grain,

shakes, large loose or dead knots, and other defects which might impair strength.

(g) When poles are constructed of two continuous lengths, they shall be two by fours, spiked together with the seam parallel to the bracket, and with 10d common nails, no more than 12 inches center to center, staggered uniformly from opposite outside edges.

(h) If two by fours are spliced to make up the pole, the splices shall be so constructed as to develop the full strength of the member. Three-eighths inch or one-half inch exterior grade plywood shall be used for a spacer between the two by fours. The joints for the splices shall be staggered on opposite sides of the pole at least four feet apart. Joints shall be no less than four feet from either end of the pole.

(i) A ladder, in accordance with WAC 296-155-480, shall be provided for access to the platform during use.

(j) Not more than two persons shall be permitted at one time upon a pump jack scaffold between any two supports.

(k) Pump jack scaffolds shall be provided with standard guardrails, unless safety belts with lifelines are used by employees.

(l) When a work bench is used at an approximate height of 42 inches, the top guardrail may be eliminated, if the work bench is fully decked, the planking secured, and is capable of withstanding 200 pounds pressure in any direction.

(m) Employees shall not be permitted to use a work bench as a scaffold platform.

(24) Factory-built scaffold units. Factory-built or prefabricated scaffold units intended for assembly on the job, prefabricated plank, staging, etc., mechanical hoisting units, or other devices for use on or in connection with any type scaffolds, shall be approved by an agency or laboratory approved by the department before being used.

(25) Waler bracket scaffolds.

(a) Waler brackets shall be constructed of 1 5/8" x 1 1/2" x 3/16" angle iron minimum size, or material of equivalent strength.

(b) All steel connections shall be welded and riveted or bolted, except where detrimental to strength of materials.

(c) The maximum length of horizontal leg shall not be more than 36" between bracket hook and railing standard.

(d) A 4" x 4" x 3/16" gusset plate shall be securely welded at inside of leg angle.

(e) Nailing holes shall be provided in lower end of vertical leg for purpose of securing bracket against lifting or shifting.

(f) Waler hook or hooks shall be a minimum of 4-inch depth and be constructed of material of a strength to support a minimum of 400 pounds at extreme outer end of bracket.

(26) Chimney, stack and tank bracket scaffolds.

(a) General. A chimney, stack or tank bracket scaffold shall be composed of a platform supported by brackets which are hooked over a steel cable which surrounds the circumference of the chimney, stack or tank

approximately in a horizontal plane. The platform shall be not less than two 2 x 10 inch planks. For a minimum width of eighteen inches wide and be designed with a safety factor of not less than 4.

(b) All brackets shall have a mild steel suspension hook 2 inches by 1/4-inch with at least 3 inches projecting beyond the throat of the hook. Hooks shall be integral with or securely attached to the bracket.

(c) Wood spacer blocks shall be provided to hold the suspending cable away from the structure at the points where brackets are hooked on. These spacer blocks shall be not less than 2 inches by 4 inches by 12 inches.

(d) All suspending cables shall be improved plow steel 6 x 19 wire rope or equivalent. In no case shall less than 1/2-inch diameter wire rope be used.

(e) The turnbuckle used to tighten suspending cables shall be not less than 1 inch drop forged steel. The cables shall be provided with thimbles and not less than 3 U-bolt type clips at each end and be attached to the turnbuckles by means of shackles. Open hooks shall not be used.

(f) All chimney, stack and tank bracket scaffolds shall be provided with standard guard rails, intermediate rails and toeboards.

(g) For access to a chimney, stack or tank bracket scaffold, ladders or a boatswain's chair shall be used.

(h) All chimney, stack or tank brackets for scaffolds shall be welded and riveted or bolted.

(27) Scaffold platforms supported by catenary or stretch cables.

(a) When a scaffold platform is supported by cables at least 4 cables shall be used, two near each end of the scaffold.

(b) The cables shall be attached to the scaffold by means of U-bolts or the equivalent through which the cables pass.

(c) Cables shall not be tightened beyond their safe working load. A hanger or set of falls shall be used approximately every 50 feet to pick up the sag in the cable.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-485, filed 1/21/86; 82-08-026 (Order 82-10), § 296-155-485, filed 3/30/82. Statutory Authority: RCW 49.17.040, 49.17.150, and 49.17.240. 79-08-115 (Order 79-9), § 296-155-485, filed 7/31/79; Order 76-29, § 296-155-485, filed 9/30/76; Order 76-6 § 296-155-485, filed 3/1/76; Order 74-26, § 296-155-485, filed 5/7/74, effective 6/6/74.]

WAC 296-155-48503 Table J-1.

TABLE J-1  
MATERIAL

	Full Thickness undressed lumber	Nominal thickness lumber <sup>1</sup>
Working load (p.s.f.)	25 50 75	25 50
Permissible span (ft.)	10 8 6	8 6

<sup>1</sup> Nominal thickness lumber not recommended for heavy duty use.

[Order 76-29, Table J-1 (codified as WAC 296-155-48503), filed 9/30/76; Order 74-26, § 296-155-485 (part), Table J-1, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-48504 Table J-2.**

**TABLE J-2**  
MINIMUM NOMINAL SIZE AND  
MAXIMUM SPACING  
OF MEMBERS OF SINGLE POLE SCAFFOLDS,  
LIGHT DUTY

	Maximum height of scaffold	
	20 ft.	60 ft.
Uniformly distributed load _____	Not to exceed 25 p.s.f.	
Poles or uprights _____	2 x 4 in.	4 x 4 in.
Pole spacing (longitudinal) _____	6 ft. 0 in.	10 ft. 0 in.
Maximum width of scaffold _____	5 ft. 0 in.	5 ft. 0 in.
Bearers or putlogs to 3 ft. 0 in. width _____	2 x 4 in.	2 x 4 in.
Bearers or putlogs to 5 ft. 0 in. width _____	2 x 6 in. or 3 x 4 in.	2 x 6 in. or 3 x 4 in. (rough)
Ledgers _____	1 x 4 in.	1 3/4 x 9 in.
Planking _____	1 1/4 x 9 in. (rough)	2 x 10 in.
Vertical spacing of horizontal members _____	7 ft. 0 in.	9 ft. 0 in.
Bracing, horizontal and diagonal _____	1 x 4 in.	1 x 4 in.
Tie-ins _____	1 x 4 in.	1 x 4 in.
Toeboards _____	4 in. high (minimum)	4 in. high (minimum)
Guardrail _____	2 x 4 in.	2 x 4 in.

All members except planking are used on edge.

[Order 76-29, Table J-2 (codified as WAC 296-155-48504), filed 9/30/76; Order 74-26, § 296-155-485 (part), Table J-2, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-48505 Table J-3.**

**TABLE J-3**  
MINIMUM NOMINAL SIZE AND MAXIMUM  
SPACING OF MEMBERS OF SINGLE POLE  
SCAFFOLDS—MEDIUM DUTY

Uniformly distributed load _____	Not to exceed 50 p.s.f.
Maximum height of scaffold _____	60 ft.
Poles or uprights _____	4 x 4 in.
Pole spacing (longitudinal) _____	8 ft. 0 in.
Maximum width of scaffold _____	5 ft. 0 in.
Bearers or putlogs _____	2 x 10 in. or 3 x 4 in.
Spacing of bearers or putlogs _____	8 ft. 0 in.
Ledgers _____	2 x 10 in.

[Title 296 WAC—p 1994]

Vertical spacing of horizontal members _____	7 ft. 0 in.
Bracing, horizontal _____	1 x 6 in. or 1 1/4 x 4 in.
Bracing, diagonal _____	1 x 4 in.
Tie-ins _____	1 x 4 in.
Planking _____	2 x 10 in.
Toeboards _____	4 in. high (minimum)
Guardrail _____	2 x 4 in.

All members except planking are used on edge.

[Order 76-29, Table J-3 (codified as WAC 296-155-48505), filed 9/30/76; Order 74-26, § 296-155-485 (part), Table J-3, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-48506 Table J-4.**

**TABLE J-4**  
MINIMUM NOMINAL SIZE AND MAXIMUM  
SPACING OF MEMBERS OF SINGLE POLE  
SCAFFOLDS—HEAVY DUTY

Uniformly distributed load _____	Not to exceed 75 p.s.f.
Maximum height of scaffold _____	60 ft.
Poles or uprights _____	4 x 6 in.
Pole spacing (longitudinal) _____	6 ft. 0 in.
Maximum width of scaffold _____	5 ft. 0 in.
Bearers or putlogs _____	2 x 10 in. or 3 x 5 in.
Spacing of bearers or putlog _____	6 ft. 0 in.
Ledgers _____	2 x 10 in.
Vertical spacing of horizontal members _____	6 ft. 6 in.
Bracing, horizontal and diagonal _____	2 x 4 in.
Tie-ins _____	1 x 4 in.
Planking _____	2 x 10 in.
Toeboards _____	4 in. high (minimum)
Guardrail _____	2 x 4 in.

All members except planking are used on edge.

[Order 76-29, Table J-4 (codified as WAC 296-155-48506), filed 9/30/76; Order 74-26, § 296-155-485 (part), Table J-4, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-48507 Table J-5.**

**TABLE J-5**  
MINIMUM NOMINAL SIZE AND  
MAXIMUM SPACING  
OF MEMBERS OF INDEPENDENT POLE  
SCAFFOLD—LIGHT DUTY

	Maximum height of scaffold	
	20 ft.	60 ft.
Uniformly distributed load _____	Not to exceed 25 p.s.f.	

TABLE J-5--cont.

	Maximum height of scaffold	
	20 ft.	60 ft.
Poles or uprights	2 x 4 in.	4 x 4 in.
Pole spacing (longitudinal)	6 ft. 0 in.	10 ft. 0 in.
Pole spacing (transverse)	6 ft. 0 in.	10 ft. 0 in.
Ledgers	1 1/4 x 4 in.	1 1/4 x 9 in.
Bearers to 3 ft. 0 in. span	2 x 4 in.	2 x 4 in.
Bearers to 10 ft. 0 in. span	2 x 6 in. or 3 x 4 in.	2 x 10 in. (rough) or 3 x 8 in.
Planking	1 1/4 x 9 in.	2 x 10 in.
Vertical spacing of horizontal members	7 ft. 0 in.	7 ft. 0 in.
Bracing, horizontal and diagonal	1 x 4 in.	1 x 4 in.
Tie-ins	1 x 4 in.	1 x 4 in.
Toeboards	4 in. high	4 in. high (minimum)
Guardrail	2 x 4 in.	2 x 4 in.

All members except planking are used on edge.

[Order 76-29, Table J-5 (codified as WAC 296-155-48507), filed 9/30/76; Order 74-26, § 296-155-485 (part), Table J-5, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-48508 Table J-6.**

TABLE J-6

MINIMUM NOMINAL SIZE AND MAXIMUM SPACING OF MEMBERS OF INDEPENDENT POLE SCAFFOLD—MEDIUM DUTY

Uniformly distributed load	Not to exceed 50 p.s.f.
Maximum height of scaffold	60 ft.
Poles or uprights	4 x 4 in.
Pole spacing (longitudinal)	8 ft. 0 in.
Pole spacing (transverse)	8 ft. 0 in.
Ledgers	2 x 10 in.
Vertical spacing of horizontal members	6 ft. 0 in.
Spacing of bearers	8 ft. 0 in.
Bearers	2 x 10 in.
Bracing, horizontal	1 x 6 in. or 1 1/4 x 4 in.
Bracing, diagonal	1 x 4 in.
Tie-ins	1 x 4 in.
Planking	2 x 10 in.
Toeboards	4 in. high (minimum)
Guardrail	2 x 4 in.

All members except planking are used on edge.

[Order 76-29, Table J-6 (codified as WAC 296-155-48508), filed 9/30/76; Order 74-26, § 296-155-485 (part), Table J-6, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-48509 Table J-7.**

TABLE J-7

MINIMUM NOMINAL SIZE AND MAXIMUM SPACING OF MEMBERS OF INDEPENDENT POLE SCAFFOLDS—HEAVY DUTY

Uniformly distributed load	Not to exceed 74 p.s.f.
Maximum height of scaffold	60 ft.
Poles or uprights	4 x 4 in.
Pole spacing (longitudinal)	6 ft. 0 in.
Pole spacing (transverse)	8 ft. 0 in.
Ledgers	2 x 10 in.
Vertical spacing of horizontal members	6 ft. 0 in.
Bearers	2 x 10 in. (rough).
Bracing, horizontal and diagonal	2 x 4 in.
Tie-ins	1 x 4 in.
Planking	2 x 10 in.
Toeboards	4 in. high (minimum)
Guardrail	2 x 4 in.

All members except planking are used on edge.

[Order 76-29, Table J-7 (codified as WAC 296-155-48509), filed 9/30/76; Order 74-26, § 296-155-485 (part), Table J-7, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-48510 Table J-8.**

TABLE J-8

TUBE AND COUPLER SCAFFOLDS LIGHT DUTY

Uniformly distributed load	Not to exceed 25 p.s.f.		
Post spacing (longitudinal)	10 ft. 0 in.		
Post spacing (transverse)	6 ft. 0 in.		
	Working Levels	Additional planked levels	Maximum height
	1	8	125 ft.
	2	4	125 ft.
	3	10	91 ft. 0 in.

[Order 76-29, Table J-8 (codified as WAC 296-155-48510), filed 9/30/76; Order 74-26, § 296-155-485 (part), Table J-8, filed 5/7/74, effective 6/6/74.]

WAC 296-155-48511 Table J-9.

TABLE J-9  
TUBE AND COUPLER SCAFFOLDS MEDIUM DUTY

Uniformly distributed load	Not to exceed 50 p.s.f.
Post spacing (longitudinal)	8 ft. 0 in.
Post spacing (transverse)	6 ft. 0 in.

Working Levels	Additional planked levels	Maximum height
1	6	125 ft.
2	0	78 ft. 0 in.

[Order 76-29, Table J-9 (codified as WAC 296-155-48511), filed 9/30/76; Order 74-26, § 296-155-485 (part), Table J-9, filed 5/7/74, effective 6/6/74.]

WAC 296-155-48512 Table J-10.

TABLE J-10  
TUBE AND COUPLER SCAFFOLDS HEAVY DUTY

Uniformly distributed load	Not to exceed 75 p.s.f.
Post spacing (longitudinal)	6 ft. 6 in.
Post spacing (traverse)	6 ft. 0 in.

Working Levels	Additional planked levels	Maximum height
1	6	125 ft.

[Order 76-29, Table J-10 (codified as WAC 296-155-48512), filed 9/30/76; Order 74-26, § 296-155-485 (part), Table J-10, filed 5/7/74, effective 6/6/74.]

WAC 296-155-48513 Table J-11.

TABLE J-11  
MINIMUM NOMINAL SIZE AND  
MAXIMUM SPACING  
OF MEMBERS OF OUTRIGGER SCAFFOLDS

Maximum scaffold load	Light duty	Medium duty
	25 p.s.f.	50 p.s.f.
Outrigger size	2 x 10 in.	3 x 10 in.
Maximum outrigger spacing	10 ft. 0 in.	6 ft. 0 in.
Planking	2 x 10 in.	2 x 10 in.
Guardrail	2 x 4 in.	2 x 4 in.

[Title 296 WAC—p 1996]

TABLE J-11—cont.

Maximum scaffold load	Light duty	Medium duty
	25 p.s.f.	50 p.s.f.
Guardrail uprights	2 x 4 in.	2 x 4 in.
Toeboards	4 in. (minimum)	4 in. (minimum)

[Order 76-29, Table J-11 (codified as WAC 296-155-48513), filed 9/30/76; Order 74-26, § 296-155-485 (part), Table J-11, filed 5/7/74, effective 6/6/74.]

WAC 296-155-48514 Table J-12.

TABLE J-12  
SCHEDULE FOR LADDER TYPE PLATFORMS

TABLE J-12—PART I

	Length of platform (feet)		
	12	14 and 16	18 and 20
Side stringers, minimum cross section (finished sizes):			
At ends (inches)	1 3/4 x 2 3/4	1 3/4 x 2 3/4	1 3/4 x 3
At middle (inches)	1 3/4 x 3 3/4	1 3/4 x 3 3/4	1 3/4 x 4
Reinforcing strip (minimum)	A 1/8 x 7/8-inch steel reinforcing strip or its equivalent shall be attached to the side or underside full length.		
Rungs	Rungs shall be 1 1/8-inches minimum diameter with at least 7/8-inch diameter tenons, and the maximum spacing shall be 12 inches center to center.		
Tie rods:			
Number (minimum)	3	4	4
Diameter (minimum)	1/4 in.	1/4 in.	1/4 in.
Flooring, minimum finished size (inches)	1/2 x 2 3/4	1/2 x 2 3/4	1/2 x 2 3/4

TABLE J-12—PART II

	Length of platform (feet)	
	22 and 24	28 and 30
Side stringers, minimum cross section (finished sizes):		
At ends (inches)	1 3/4 x 3	1 3/4 x 3 1/2
At middle (inches)	1 3/4 x 4 1/4	1 3/4 x 5
Reinforcing strip (minimum)	A 1/8 x 7/8-inch steel reinforcing strip or its equivalent shall be attached to the side or underside full length.	

(1989 Ed.)

TABLE J-12--PART II

	Length of platform (feet)	
	22 and 24	28 and 30
Rungs	Rungs shall be 1 1/8-inches minimum diameter with at least 7/8-inch diameter tenons, and the maximum spacing shall be 12 inches center to center.	
Tierods:		
Number (minimum)	5	6
Diameter (minimum)	1/4 in.	1/4 in.
Flooring, minimum finished size (inches)	1/2 x 2 3/4	1/2 x 2 3/4

[Order 76-29, Table J-12 (codified as WAC 296-155-48514), filed 9/30/76; Order 74-26, § 296-155-485 (part), Table J-12, filed 5/7/74, effective 6/6/74.]

WAC 296-155-48515 Table J-13.

TABLE J-13

MINIMUM DIMENSIONS FOR BRICKLAYERS' SQUARE SCAFFOLD MEMBERS

Members	Dimensions
Bearers or horizontal members	2 x 6 in.
Legs	2 x 6 in.
Braces at corners	1 x 6 in.
Braces diagonally from center frame	1 x 8 in.

[Order 76-29, Table J-13 (codified as WAC 296-155-48515), filed 9/30/76; Order 74-26, § 296-155-485 (part), Table J-13, filed 5/7/74, effective 6/6/74.]

WAC 296-155-48516 Table J-14.

TABLE J-14

MINIMUM DIMENSIONS FOR HORSE SCAFFOLD MEMBERS

Members	Dimensions
Horizontal members or bearers	3 x 4 in.
Legs	1 1/4 x 4 1/2 in.
Longitudinal brace between legs	1 x 6 in.
Gusset brace at top of legs	1 x 8 in.
Half diagonal braces	1 1/4 x 4 1/2 in.

[Order 76-29, Table J-14 (codified as WAC 296-155-48516), filed 9/30/76; Order 74-26, § 296-155-485 (part), Table J-14, filed 5/7/74, effective 6/6/74.]

WAC 296-155-48517 Table J-15.

TABLE J-15

MINIMUM DESIGN CRITERIA FOR FIGURE-FOUR FORM SCAFFOLDS

Members	Dimensions
Uprights	2 x 4 in. or 2 x 6 in.
Outriggers ledgers (two)	1 x 6 in.
Braces	1 x 6 in.
Guardrails	2 x 4 in.
Guardrail height	Approximately 42 in.
Intermediate guardrails	1 x 6 in.
Toeboards	4 in. (minimum).
Maximum length of ledgers	3 ft. 6 in. (unsupported).
Planking	2 x 10 in.
Upright spacing	8 ft. 0 in. (on centers).

[Order 76-29, Table J-15 (codified as WAC 296-155-48517), filed 9/30/76; Order 74-26, § 296-155-485 (part), Table J-15, filed 5/7/74, effective 6/6/74.]

WAC 296-155-48518 Table J-16.

TABLE J-16

MINIMUM DESIGN CRITERIA FOR METAL BRACKET FORM SCAFFOLDS

Members	Dimensions
Uprights	2 x 4 in.
Guardrails	2 x 4 in.
Guardrail height	Approximately 42 in.
Intermediate guardrails	1 x 6 in.
Toeboards	4 in. (minimum)
Planking	2 x 9 in.

[Order 76-29, Table J-16 (codified as WAC 296-155-48518), filed 9/30/76; Order 74-26, § 296-155-485 (part), Table J-16, filed 5/7/74, effective 6/6/74.]

WAC 296-155-48519 Table J-17.

TABLE J-17

MINIMUM DESIGN CRITERIA FOR WOODEN BRACKET FORM SCAFFOLDS

Members	Dimensions
Uprights	2 x 4 in. or 2 x 6 in.
Support ledgers	2 x 6 in.
Maximum scaffold width	3 ft. 6 in.
Braces	1 x 6 in.
Guardrails	2 x 4 in.
Guardrail height	Approximately 42 in.
Intermediate guardrail	1 x 6 in.
Toeboards	4 in. (minimum).
Upright spacing	8 ft. 0 in. (on centers).

[Order 76-29, Table J-17 (codified as WAC 296-155-48519), filed 9/30/76; Order 74-26, § 296-155-485 (part), Table J-17, filed 5/7/74, effective 6/6/74.]

WAC 296-155-48523 Manually propelled mobile ladder stands and scaffolds (towers). (1) All applicable rules for design, construction, maintenance, operation, testing, and use of manually propelled mobile ladder stands and scaffolds (towers) shall be in accordance with ANSI A92.1-1977.

(2) General and design requirements: Stands and scaffolds of this section shall meet the requirements specified:

(a) The design working load of ladder stands shall be calculated on the basis of one or more two hundred fifty-pound persons together with fifty pounds of equipment each.

(b) The design working load of all scaffolds shall be calculated on the basis of:

- (i) LIGHT – Designed and constructed to carry a working load of 25 lb/ft<sup>2</sup>
- (ii) MEDIUM – Designed and constructed to carry a working load of 50 lb/ft<sup>2</sup>
- (iii) HEAVY – Designed and constructed to carry a working load of 75 lb/ft<sup>2</sup>

(c) All ladder stands and scaffolds shall be capable of supporting at least four times the design working load.

(d) The materials used in mobile ladder stands and scaffolds shall be of standard manufacture and conform to standard specifications of strength, dimensions, and weights, and shall be selected to safely support the design working load.

(e) Nails, bolts, weldments, or other mechanical fasteners used in the construction of ladders, scaffolds, and towers shall be of adequate size and in sufficient numbers at each connection to develop the designed strength of the unit. Nails shall be driven full length and all exposed surfaces shall be free from sharp edges, burrs, or other safety hazards.

(f) The maximum work level height shall not exceed four times the minimum or least base dimension of any mobile ladder stand or scaffold. Where the basic mobile unit does not meet this requirement, outrigger frames shall be employed to achieve this least base dimension, or provisions shall be made to guy or brace the unit against tipping.

(g) The minimum platform width for any work level shall not be less than eighteen inches for mobile scaffolds (towers).

(h) Ladder stands shall have a minimum step width of sixteen inches.

(i) The supporting structure for the work level shall be rigidly braced, using cross bracing, diagonal bracing, knee braces, or the equivalent, with rigid platforms or steps at each work level.

(j) The steps and platform of ladder stands and scaffolds shall be fabricated from slip-resistant materials.

(k) The work level platform of scaffolds (towers) shall be made of wood, aluminum, or plywood planking, steel, or expanded metal, for the full width of the scaffold, except for necessary openings.

(i) Work platforms shall be secured in place.

(ii) The clearances between adjacent platform boards or scaffold members, or both, shall not exceed one inch.

(iii) All planking shall be two inch (nominal) scaffold grade minimum 1500 lbf/in<sup>3</sup> (stress grade) construction grade lumber, or the equivalent.

(l) All scaffold and ladder stand platform work levels ten feet or higher above the ground or floor shall have a

standard (1 x 4 lumber nominal or the equivalent) toeboard.

(m) All scaffold and ladder stand platform work levels with platform height of four feet or greater shall be provided with guardrails and midrails on exposed sides and end wherever the horizontal dimension of the platform in either direction is less than forty-five inches.

(n) All scaffold and ladder stand platform work levels ten feet or higher above the ground or floor shall be provided with standard guardrails.

(o) A climbing ladder or stairway shall be provided for proper access and egress, and shall be affixed or built into the scaffold and so located that its use will not have a tendency to tip the scaffold.

(p) Where the horizontal members of the scaffold frame are spaced not more than sixteen inches apart, and a standard guardrail has been provided on the scaffold platform to serve as handholds during access to the platform, persons may use the scaffold frames for access and exit, provided that scaffold platform does not project beyond the bearer.

(q) Wheels or casters, when under load, shall be properly designed for strength and dimensions to support four times the design working load.

(i) All scaffold casters shall be provided with a positive wheel or swivel lock, or both, to prevent movement.

(ii) Ladder stands shall have at least two locking casters or other means of locking the unit in position.

(iii) Swivel casters, if used, shall be provided with a positive lock.

(iv) Where leveling of the elevated work platform is required, screw jacks or other suitable means for adjusting the height shall be provided in the base section of each mobile unit.

(3) Mobile tubular fabricated frame scaffolds: Mobile tubular fabricated frame scaffolds shall be designed to comply with the requirements of subsections (1) through (2)(q) of this section.

(a) Scaffolds shall be braced by cross braces or diagonal braces, or both, for securing vertical members together laterally.

(b) The cross braces shall be of a length that will automatically square and align vertical members so that the erected scaffold is always plumb, square, and rigid.

(c) Spacing of panels of frames shall be consistent with the loads imposed.

(d) The frames shall be placed one on top of the other with coupling or stacking pins to provide vertical alignment of the legs.

(e) Where uplift may occur, panels shall be locked together vertically by pins or other equivalent means.

(f) Only the manufacturer of the scaffold or the manufacturer's qualified designated agent shall be permitted to erect or supervise the erection of scaffolds exceeding fifty feet in height above the base, unless:

(i) Such structure is approved in writing by a licensed professional engineer;

(ii) Erected in accordance with instructions furnished by the manufacturer.



(4) Mobile tubular fabricated sectional folding scaffolds: Mobile tubular fabricated sectional folding scaffolds, including sectional stairway and sectional ladder scaffolds, shall be designed to comply with the requirements of subsections (1) through (2)(q) of this section.

(a) An integral stairway and work platform shall be incorporated into the structure of each sectional folding stairway scaffold.

(b) An integral set of pivoting and hinged folding diagonal and horizontal braces and a detachable work platform shall be incorporated into the structure of each sectional folding ladder scaffold.

(c) The end frames of sectional ladder and stairway scaffolds shall be designed so that the horizontal bearers provide supports for multiple planking levels.

(d) Only the manufacturer of the scaffold or his qualified designated agent shall be permitted to erect or supervise the erection of scaffolds exceeding fifty feet in height above the base, unless:

(i) Such structure is approved in writing by a licensed professional engineer;

(ii) Erected in accordance with instructions furnished by the manufacturer.

(5) Mobile tube and coupler scaffolds: Mobile tube and coupler scaffolds shall be designed to comply with the requirements of subsections (1) through (2)(q) of this section.

(a) The material used for the couplers shall be of a structural type, such as a drop-forged steel, malleable iron, or structural grade aluminum.

(b) The use of gray cast iron is prohibited.

(c) Only the manufacturer of the scaffold or his qualified designated agent shall be permitted to erect or supervise the erection of scaffolds exceeding fifty feet in height above the base, unless:

(i) Such structure is approved in writing by a qualified engineer.

(ii) Erected in accordance with instructions furnished by the manufacturer.

(6) Mobile work platforms: Mobile work platforms shall be designed for the use intended and shall comply with the requirements of subsections (1) through (2)(q) of this section.

(a) The minimum width of the base of mobile work platforms shall not be less than eighteen inches.

(b) Adequate rigid bracing to vertical members shall be provided.

(7) Mobile ladder stands: Mobile ladder stands shall comply with applicable requirements of subsections (1) through (2)(q) of this section.

(a) The minimum base width shall conform to subsection (2)(f) of this section.

(b) The minimum length of the base section shall be the total length of combined steps and top assembly, measured horizontally, plus five-eighths inch per step of rise.

(c) Steps shall be uniformly spaced and sloped, with a rise of not less than nine inches or more than ten inches and a depth of not less than seven inches.

(d) The slope of the steps shall be a maximum of sixty degrees measured from the horizontal.

(e) Units having more than four steps shall be equipped with handrails.

(i) Handrails shall be a minimum of thirty inches plus or minus one inch in height.

(ii) Measurements shall be taken vertically from the center of the step.

(f) The load shall be applied uniformly to a three and one-half inch wide area front to back at the center of the width span with a safety factor of four.

(8) Scaffold and ladder stands: Scaffolds and ladder stands shall be furnished, where ladders or other equipment are not deemed appropriate, and erected in accordance with this standard for persons engaged in work that cannot be done safely from the ground or from solid construction, and where it is desired to facilitate relocation of the unoccupied units without disassembly.

(a) Persons shall be prohibited from riding on units while they are being moved, and materials, tools, or equipment shall not be stored on the units while they are being moved except under strict compliance with the provisions following, and only with extreme care and caution exercised by the user.

(b) Guardrails, midrails, and toeboards shall be installed as required by subsection (2)(l), (m) and (n) of this section.

(c) The floor or surface shall be within three degrees of level, smooth (the equivalent of broom-finished concrete), and free from pits, holes, or obstructions.

(d) The minimum dimension of the scaffold base when ready for rolling shall be at least one-half of the height.

(e) Outriggers, if used, shall be installed on all four sides of the scaffold and then can be included as a part of the base dimension.

(f) All tools or materials, or both, shall be secured or removed from the platform before the mobile scaffold is moved.

(g) Employees on the mobile scaffold shall be advised and be aware of each movement in advance.

(h) Employees on the work platform of the mobile scaffold may move the scaffold when the mobile scaffold is equipped with a manual system in which the propelling force is applied to the wheels only and cannot exceed normal walking speed.

(i) The force necessary to move the mobile scaffold shall be applied as close to the base as practicable, and provision shall be made to stabilize the tower during movement from one location to another.

(j) The vertical posts of frames shall be accurately spaced and rest upon suitable footing capable of carrying the maximum design load without settling or displacement. They shall be plumb, and securely and rigidly braced to prevent swaying and displacement.

(k) Where leveling of the mobile scaffold platform is required, screw jacks or other means for adjusting the height shall be provided in each leg section of each mobile unit.

(i) At least six inches of the screw jack shall be in the scaffold leg.

(ii) The screw jack shall not be extended more than twelve inches.

(l) Units shall be erected, used, and disassembled in accordance with instructions furnished by the manufacturer.

(m) Scaffolds shall be erected and used only by personnel who have been trained in their erection.

(n) Units shall be inspected before and after use.

(o) Units shall not be loaded in excess of the design working load.

(p) Units shall be repaired immediately when damaged or weakened from any cause.

(q) They shall not be used until repairs are completed.

(r) Units shall not be altered while they are in use or occupied.

(s) They shall be securely locked to prevent movement while occupied.

(t) Overhead protection shall be provided for the work platform, consisting of two-inch (nominal) planking, or the equivalent, not more than nine feet above the platform when an overhead hazard exists to the user on the platform.

(u) Ladders or unstable objects shall not be placed on top of rolling scaffolds to gain greater height.

(v) Persons shall not work on scaffolds during high winds, storms, or when the scaffolds are covered with ice or snow until all the ice and snow has been removed and the platform is sanded.

(w) Persons climbing or descending scaffold ladders shall have both hands free for climbing and shall remove foreign substances, such as, but not limited to, mud or grease from their shoes.

(x) Where moving vehicles are present, the scaffold area shall be marked with warnings, such as, but not limited to, flags, roped off areas, and barricades.

(y) Unstable objects such as barrels, boxes, loose brick, tools, and debris shall not be allowed to accumulate on the work level.

(z) In operations involving production of small debris, chips, etc., and the use of small tools and materials, and where persons are required to work or pass under the equipment, screens shall be required and properly secured between toeboards and guardrails. The screen shall extend along the entire opening, and shall consist of No. 19 gage U.S. standard wire one-half inch mesh, or the equivalent.

(9) Required markings and data plates. Each unit shall be marked with the manufacturer's or vendor's name or identification symbol and rated working load, and shall indicate conformance to ANSI A92.1-1977 or a revision thereof.

(a) These markings shall be either stamped into a metal component of the unit, or provided on a metal name plate, or equivalent durable label, permanently secured to the unit.

(b) Precautionary labels or signs shall be permitted to warn of common hazards anticipated with the use of specific products, such as electrical hazards and contact with corrosive substances.

(c) Additional items for labeling consideration are inspection, proper selection, setup, climbing instructions, storage and care, and other instructions as deemed necessary.

(d) The precautionary labels or signs shall conform to the requirements of ANSI Specifications for Accident Prevention Signs, ANSI Z35.1-1972, and ANSI Specifications for Informational Signs Complementary to Accident Prevention Signs, ANSI Z35.4-1973.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-48523, filed 1/21/86.]

**WAC 296-155-48525 Manually propelled elevating work platforms.** (1) All applicable rules for design, construction, maintenance, operation, testing and use of manually propelled elevating work platforms shall be in accordance with ANSI A92.3-1980.

(2) General requirements.

(a) Any manually propelled elevating work platform, when raised to its maximum working height, on level ground, shall be capable of sustaining, without reaching instability, a minimum horizontal test force of fifty pounds or fifteen percent of the rated capacity, whichever is greater, applied to any point on the perimeter of the platform while the platform is carrying the rated work load.

(b) Any manually propelled elevating work platform, unless designed for such use by the manufacturer, shall not be used on an inclined surface.

(c) Any work platform designed by the manufacturer to be operated on an inclined surface shall also be capable of passing the stability tests outlined in (a) of this subsection while on such a surface. Procedures for maintaining stability shall be clearly outlined in the special warnings section of the operating instructions and users shall follow these instructions.

(d) If outriggers or stabilizers must be employed to meet the tests for stability outlined in (a) of this subsection, the operating instructions shall require their use and such outriggers or stabilizers shall be provided and used.

(e) The platform width shall not be less than eighteen inches and shall be provided with a surface to minimize slipping.

(f) The platform shall be provided with a guardrail or other structure around its upper periphery and the guardrail shall be approximately forty-two inches high, plus or minus three inches, with a midrail approximately midway between the top rail and the platform surface.

(i) The guardrail system shall be designed and constructed to withstand a load of twenty-five pounds per linear foot applied in a horizontal direction to the top rail or midrail.

(ii) The top rail or midrail shall withstand a concentrated load of three hundred pounds applied vertically to the top of either rail midway between the supporting posts.

(iii) Guardrail terminal posts shall withstand two hundred pounds applied in any direction at the top of the post.

(g) The platform shall be provided with four-inch (nominal dimension) toeboards on all sides.

(h) Toeboards may be omitted at the access openings.

(i) The configuration of the work platform shall include access for personnel to use in reaching the platform deck when it is in the lowered position.

(i) Any access system used in this way shall have rungs or steps located on uniform centers not to exceed sixteen inches.

(ii) Steps or rungs shall be provided with a face that minimizes slipping.

(3) Safety factor specifications.

(a) Where the platform is supporting its rated work load by a system of wire ropes or chains, or both, the safety factor of the wire rope or chain shall not be less than eight to one, based on ultimate strength.

(b) All critical components of a hydraulic or pneumatic system used in a work platform shall have a bursting strength that exceeds the pressure attained when the system is subjected to the equivalent of four times the rated work load. (Critical components are those in which failure would result in a free descent.)

(c) All noncritical hydraulic components shall have a bursting strength safety factor of at least two to one.

(4) Fail safe requirements.

(a) Where the elevation of the platform is accomplished by an electromechanical assembly, the system shall be designed to prevent free descent in the event of a generator or power failure.

(b) Where the elevation of the platform is accomplished by a hydraulic or pneumatic cylinder assembly, the system shall be so equipped as to prevent free descent in the event of failure of a hydraulic or pneumatic line.

(c) Where the platform is horizontally extendable beyond the base of the machine, the system shall be so equipped as to prevent descent in the event of failure of a hydraulic or pneumatic line, wire rope, or chain.

(d) Where the elevation of the platform is accomplished by a single hoist cable, the system shall be protected by a broken-cable safety device which will prevent free descent of the platform.

(e) Where the elevation of the platform is accomplished by a manual-mechanical or manual-hydraulic assembly, the considerations established above shall apply.

(f) The control system shall be designed so that a single malfunction in the control system will not result in unintended machine motion.

(g) Hydraulically or pneumatically actuated outriggers or stabilizers, or both, shall be so constructed as to prevent their retraction in the event of failure of a hydraulic or pneumatic line.

(5) Emergency lowering means. Any work platform equipped with a powered elevating assembly shall be supplied with clearly marked emergency lowering means readily accessible from ground or floor level.

(6) Guarding. Mechanical power transmission apparatus shall be guarded in accordance with WAC 296-24-205, General safety and health standards.

(7) Directional controls.

(a) All directional controls shall be marked for the direction they control and shall be of the type which automatically returns to the "off" or the neutral position when released.

(b) Controls shall be protected against inadvertent operation.

(8) Motor requirements.

(a) Fuel lines of internal-combustion-engine-powered work platforms shall be supported to minimize chafing and positioned to minimize exposure to engine exhaust heat. Liquid fuel lines shall be hard lines except where isolation from vibration requires a flexible connection.

(b) LP-gas engine fuel systems shall comply with the American National Standard for Storage and Handling of Liquefied Petroleum Gases, ANSI/NFPA 58-1983.

(c) The exhaust system shall be provided with a muffler that is positioned to minimize exposure to noise and exhaust gas of the operators and personnel located in proximity to the unit.

(9) Prevention of lateral movement. Each work platform shall be provided with locking screws, floor locks, wheel-locking mechanisms, or other means of preventing unintended lateral motions while in use.

(10) Specifications display. The following information shall be displayed on all work platforms in as permanent and as visible a manner as practical:

(a) Warnings, cautions, or restrictions for safe operation in accordance with American National Standard Specifications for Accident Prevention Signs, ANSI Z35.1-1972 and ANSI Z35.4-1973.

(b) Make, model, serial number, and manufacturer's name and address.

(c) Rated work load.

(d) Maximum platform height.

(e) Nominal voltage rating of batteries or rated voltage of AC line.

(f) Statement of the need for the operator's familiarity with the work platform before it is used.

(11) Alternative configuration statement. When a work platform is designed with alternative configurations:

(a) The manufacturer shall clearly describe these alternatives, including the rated capacity in each situation.

(b) If the rated work load of a platform is the same in any designed configuration, these additional descriptions are not necessary.

(12) Insulation marking. A statement of whether or not the work platform is electrically insulated. If insulated, the level of protection and the applicable test standard shall be stated in accordance with ANSI A92.2-1979.

(13) Maintenance and operating manuals requirement. An operating and maintenance manual(s) shall be provided with each work platform and shall contain:

(a) Descriptions, specifications, and ratings of the work platform, including the data specified in subsection (10) of this section.

(b) The maximum hydraulic and pneumatic systems pressure and the maximum voltage of the electrical systems which are part of the work platform.

(c) Instructions regarding operation and maintenance.

(d) Replacement part(s) information.

(14) Rated load display. The rated work load shall be clearly displayed at each entrance to the work platform.

(15) Management responsibilities.

(a) Employers responsibilities shall be in accordance with ANSI A92.3-1980.

(b) Only trained and authorized personnel shall be permitted to operate the work platform.

(c) Work platforms that are not in safe operating condition shall be removed from service until repaired.

(d) Repairs shall be made by a qualified person in conformance with the manufacturer's operating and maintenance manuals.

(e) Operators shall be trained in care and use before operation, care and use during operation, horizontal relocation, and additional requirements as specified in ANSI A92.3-1980.

(f) Modifications or alterations of work platforms shall be made only with written permission of the manufacturer or any other equivalent entity.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-48525, filed 1/21/86.]

**WAC 296-155-48527 Self propelled elevating work platforms.** (1) All applicable rules for design, construction, maintenance, operation, testing and use of self propelled elevating work platforms shall be in accordance with ANSI A92.6-1979.

(2) Minimum rated work load.

(a) The minimum rated work load of work platforms shall not be less than two hundred fifty pounds.

(b) All structural load-supporting elements of the work platform shall have a structural safety factor of not less than two based on the minimum yield strength of the material.

(c) All structural load-supporting elements of the work platform that are made of nonductile material (such as cast iron and fiberglass) shall have a structural safety factor of not less than five based on the minimum ultimate strength of the material.

(d) Design and stability tests shall be in accordance with ANSI A92.6-1979.

(e) Each production unit on level ground shall sustain a load test which shall include the movement of the platform (with a platform load at least one hundred fifty percent of the rated capacity imposed) through its entire range of motion.

(3) Driving interlock.

(a) The unit shall use interlock means that will prevent driving the unit unless the platform height, platform configuration, or any combination of the foregoing, are adjusted to meet the stability test requirements.

(b) A work platform limited in driveable height by the interlock means may be elevated and used while stationary up to the maximum platform heights at which it will maintain stability during the following static test. At the maximum platform height, on level ground, with the platform carrying the rated work load, apply a horizontal test force of one hundred fifty pounds or fifteen percent of the rated platform load (whichever is greater) at

the point on the perimeter of the platform most likely to cause overturning.

(4) Platform outrigger interlocks. Where outriggers, stabilizers, or extendable axles are required to meet the side load test, interlocks shall prevent the platform from being raised above the height at which these devices are required unless the required devices are extended. Interlocks shall also prevent the retraction of these devices while the platform is above that level.

(5) Platform requirement.

(a) A guardrail or other structure shall be provided around its upper periphery, which shall be approximately forty-two inches plus or minus three inches in height, a midrail, and toeboards which shall be not less than four inches high (nominal dimension). Guardrail and midrail chains, or the equivalent, may be substituted across an access opening. Toeboards may be omitted at the access opening.

(b) The work platform shall have a minimum width of eighteen inches and proper access for personnel to use in reaching the platform deck when it is in the lowered position shall be provided.

(c) The surface for both the platform and access shall be provided that will minimize slipping.

(6) System safety factors.

(a) Where the platform is supporting its rated work load by a system of wire ropes or chains, or both, the safety factor of the wire rope or chains shall not be less than eight to one, based on ultimate strength.

(b) All critical hydraulic components, all pneumatic components, and all hoses of hydraulic or pneumatic systems shall have a minimum bursting strength of at least four times the operating pressure for which the system is designed.

(c) Noncritical hydraulic components shall have a minimum bursting strength of at least two times the operating pressure for which the system is designed.

(7) Safety design requirements.

(a) Where the elevation of the platform is accomplished by an electromechanical assembly, the system shall be designed to prevent free descent in the event of a generator or power failure.

(b) Where the elevation of the platform is accomplished by a hydraulic or pneumatic cylinder assembly, the system shall be so equipped as to prevent free descent in the event of a hydraulic or pneumatic line failure.

(c) Where the platform is horizontally extendable beyond the base of the machine, the system shall be so equipped as to prevent descent in the event of a hydraulic or pneumatic line failure.

(d) Where the elevation of the platform is accomplished by a single hoist cable, the system shall be protected by a broken-cable safety device that will prevent free descent of the platform.

(e) In addition to the primary operator controls, the work platform shall be equipped with an emergency stop device located at the primary control station that will deactivate all powered functions.

(f) Hydraulically or pneumatically actuated outriggers or stabilizers, or both, shall be designed to prevent

their retraction in the event of a hydraulic or pneumatic line failure.

(g) Any work platform equipped with a powered elevating assembly shall be supplied with clearly marked emergency lowering means readily accessible from ground level.

(h) Mechanical power transmission apparatus shall be guarded in accordance with WAC 296-24-205, General safety and health standards.

(8) Directional controls.

(a) All directional controls shall move in the direction of the function they control and be of the type that automatically return to the off or the neutral position when released.

(b) Such controls shall be protected against inadvertent operation and shall be clearly marked.

(9) Engine requirement.

(a) Fuel lines of internal-combustion-engine-powered work platforms shall be supported to keep chafing to a minimum and located to keep exposure to engine and exhaust heat to a minimum.

(b) Liquid fuel lines shall be hard except where flexible connections are required for isolation from vibration.

(c) LP gas fuel systems shall use flexible LP gas hose or hard lines.

(d) Exhaust lines shall be equipped with mufflers and shall be located to minimize the exposure to noise and fumes of operators and personnel located in the proximity of such units.

(10) Each work platform shall be equipped with a mechanical parking brake, which will hold the unit on any slope it is capable of climbing.

(11) Specifications display. The following information shall be displayed on all work platforms in a clearly visible, accessible area and in as permanent a manner as possible:

(a) Warnings, cautions, or restrictions for safe operation in accordance with ANSI Z35.1-1972 and ANSI Z35.4-1973.

(b) Make, model, serial number, and manufacturer's name and address.

(c) Rated work load.

(d) Maximum platform height.

(e) Nominal voltage of the batteries if battery powered.

(f) A notice to study the operating/maintenance manual before using the equipment.

(g) Alternative configuration statement. If a work platform is susceptible to several alternative configurations, then the manufacturer shall clearly describe these alternatives, including the rated capacity in each situation. If the rated work load of a work platform is the same in any configuration, these additional descriptions are not necessary.

(h) A clear statement of whether or not the platform and its enclosure are electrically insulated. If insulated, the level of protection and the applicable test standard shall be stated, in accordance with ANSI 92.2-1979.

(i) The rated work load shall be clearly displayed at each entrance to the platform.

(12) Lift manual requirement. Each work platform shall be provided with an appropriate manual. The manual shall contain:

(a) Descriptions, specifications, and ratings of the work platform, including the data specified in subsection (11)(h) and (i) of this section.

(b) The maximum system pressure and the maximum voltage of the electrical systems that are part of the work platform.

(c) Instructions regarding operation, maintenance, and weld specifications.

(d) Replacement parts information.

(13) Inspection and maintenance.

(a) Each work platform shall be inspected, maintained, repaired and kept in proper working order in accordance with the manufacturer's maintenance and repair manuals.

(b) Any work platform not in safe operating condition shall be removed from service until it is repaired.

(c) All repairs shall be made by a qualified service person in conformance with the manufacturer's maintenance and repair manuals.

(14) Operator requirements. Only trained and authorized personnel shall be permitted to operate the work platform. Before using the work platform, the operator shall have:

(a) Read and understood the manufacturer's operating instructions and safety rules, or been trained by a qualified person on the contents of the manufacturer's instructions and safety rules.

(b) Read and understood all decals, warnings, and instructions on the work platform.

(c) On a daily basis, before the work platform is used, it shall be given a thorough inspection, which shall include:

(i) Inspection for defects such as cracked welds, hydraulic leaks, damaged control cable, loose wire connections, and tire damage.

(ii) Inspection of functional controls for proper operation.

(d) Any suspect items discovered through inspection shall be carefully examined and a determination made by a qualified service person as to whether they constitute a safety hazard. All unsafe items shall be corrected before further use of the work platform.

(e) Before the work platform is used, the operator shall survey the area for hazards such as:

(i) Untamped earth fills.

(ii) Ditches.

(iii) Dropoffs or holes.

(iv) Bumps and floor obstructions.

(v) Debris.

(vi) Overhead obstructions and high-voltage conductors.

(vii) Other possible hazardous conditions.

(15) Requirement for operations. The work platform shall be used only in accordance with the Manufacturer's Operating Instructions and Safety Rules, ANSI A92.6-1979, and this standard.

(a) Only trained and authorized personnel shall be permitted to operate the work platform.

(b) Before each elevation of the work platform, the operator shall:

(i) Check for overhead obstructions and high-voltage conductors. A minimum distance of ten feet from energized high-voltage conductors shall be maintained at all times between the conductors and the operator and platform equipment.

(ii) Ensure that the work platform is elevated only on a firm and level surface.

(iii) Ensure that the load and its distribution on the platform are in accordance with the manufacturer's rated capacity. The manufacturer's recommended load limits shall never be exceeded.

(iv) Ensure that outriggers and stabilizers are used if the manufacturer's instructions require their use.

(v) Ensure that guardrails are properly installed, and gates or openings are closed.

(c) Before and during driving while the platform is elevated, the operator shall:

(i) Be required to look in the direction of, and keep a clear view of, the path of travel and assure that the path of travel is firm and level.

(ii) Maintain a safe distance from obstacles, debris, dropoffs, holes, depressions, ramps, or other hazards to safe elevated travel.

(iii) Maintain a safe distance from overhead obstacles.

(d) Under all travel conditions, the operator shall limit travel speed in accordance with conditions of ground surface, congestion, slope, location of personnel, and other factors which may create a hazard of collision or injury to personnel.

(e) Stunt driving and horseplay shall not be permitted.

(f) Personnel shall maintain a firm footing on the platform while working thereon unless they are secured by safety harness and lanyard devices fixed to manufacturer-approved hard points. Use of railings or planks, ladders or any other device on the work platform for achieving additional height shall be prohibited.

(g) The operator shall immediately report defects or malfunctions which become evident during operation and shall discontinue use of the work platform until correction has been made.

(h) Altering or disabling of safety devices or interlocks shall be prohibited.

(i) Care shall be taken to prevent ropes, electric cords, hoses, etc., from becoming entangled in the work platform when the platform is being elevated, lowered, or moved.

(j) Work platform rated capacities shall not be exceeded when loads are transferred to the platform at elevated heights.

(k) The operator shall ensure that the area surrounding the work platform is clear of personnel and equipment before lowering the platform.

(16) Fuel tanks shall not be filled while the engine is running. Spillage shall be avoided.

(17) Batteries shall not be charged except in an open, well-ventilated area, free of flame, smoking, spark, or fire.

(18) Modifications. All modifications and alterations to work platforms shall be certified in writing by the

manufacturer or by any other equivalent entity, such as a nationally recognized testing laboratory, as being in conformance with all applicable provisions of ANSI A92.6-1979.

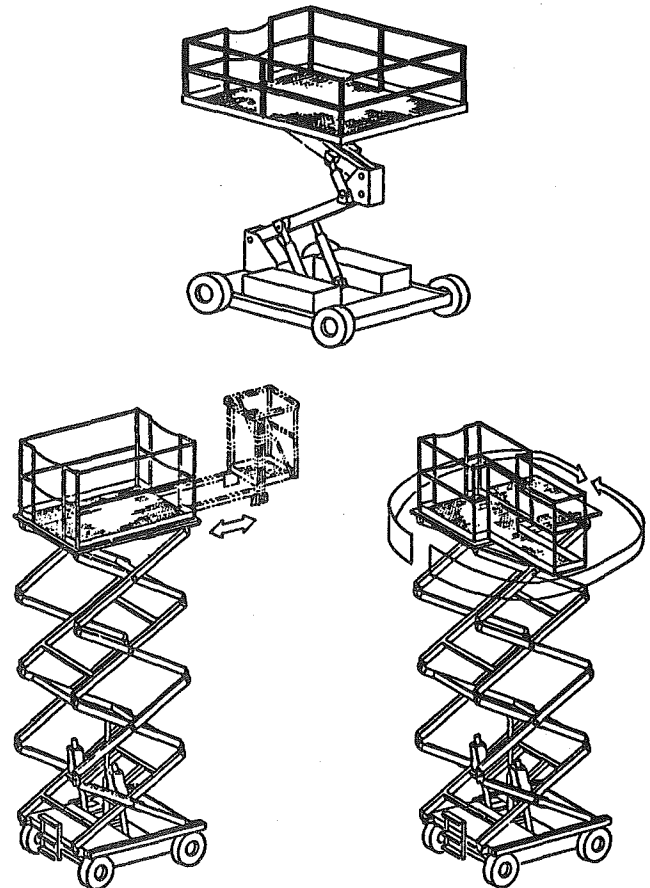


Fig. 1  
Examples of Work Platforms

[Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-48527, filed 1/21/86.]

**WAC 296-155-48529 Boom supported elevating work platforms.** (1) All applicable rules for design, construction, maintenance, operation, testing and use of boom supported elevating work platforms shall be in accordance with ANSI A92.5-1980.

(2) Minimum rated work load. The minimum rated work load of a work platform shall be three hundred pounds. Either single or multiple ratings may be used.

(a) Work platforms with single ratings shall include means which clearly present the rated work load to the operator at the platform control station.

(b) Work platforms having multiple configurations with multiple ratings shall have means which clearly describe the rated work load of each configuration to the operator at the platform control station. Examples of multiple configurations are:

(i) Outriggers extended to firm footing versus outriggers not extended.



- (ii) Large platform versus small platform.
  - (iii) Extendable boom retracted versus extended.
  - (iv) Boom elevated versus lowered.
  - (v) Extendable axles extended versus retracted.
- (3) Boom angle indicator: When the rated capacity of the alternate configuration depends on the angle the boom makes with the horizontal, the manufacturer shall install means by which that angle can be determined. Such means shall be clearly displayed to the operator at the platform control station.

(4) Structural safety.

(a) All load-supporting structural elements of the work platform shall have a structural safety factor of not less than two to one based on the minimum yield strength of the materials used.

(b) The load-supporting structural elements of the work platform that are made of nonductile material which will not deform plastically before breaking shall have a structural safety factor of not less than five to one based on the minimum ultimate strength of the materials used.

(c) The design stress used in determining the structural safety factor shall be the maximum stresses developed within the element with the machine operating at its rated work load, used in the type of service for which it was designed, and operated in accordance with manufacturer's operation instructions.

(d) The design stress shall include the effects of stress concentration and dynamic loading as shown in ANSI A92.5-1980.

(5) Platform stability.

(a) Each work platform shall be capable of maintaining stability while sustaining a static load equal to one and one-third times its rated work load, concentrated anywhere twelve inches inside the perimeter of the platform, throughout its entire range of motion while on a slope of five degrees from the horizontal in the direction most likely to cause overturning.

(i) If having the outriggers, stabilizers, or extendable axles in contact with the supporting surface is part of the normal configuration to meet the stability requirements, they shall be extended.

(ii) A visual inspection shall be made to determine whether this test has produced an adverse effect on any component.

(b) Each work platform shall sustain on level ground a test load equal to one and one-half times its rated work load throughout the entire range of motion in which the boom can be placed.

(i) The test load shall be placed with its center of gravity twelve inches inboard from the guardrail while the unit is in the least stable position.

(ii) The work platform shall remain stable during this test.

(iii) A visual inspection shall be made to determine whether this test has produced an adverse effect on any component.

(c) Each work platform shall be capable of maintaining stability when positioned on a five degree slope in its backward stability configuration in the direction and

condition most likely to cause overturning, while sustaining a horizontal force of one hundred fifty pounds or fifteen percent of rated capacity, whichever is greater, applied to the upper perimeter of the platform in the direction most likely to cause overturning (see Fig. 1). Note that the most adverse condition may be with zero or with rated work load (concentrated one foot inside perimeter of platform), depending on basket configuration.

(i) If having the outriggers, stabilizers, or extendable axles in contact with the supporting surface is part of the normal configuration to meet stability requirements, they shall be extended.

(ii) A visual inspection shall be made to determine whether this test has produced an adverse effect on any component.

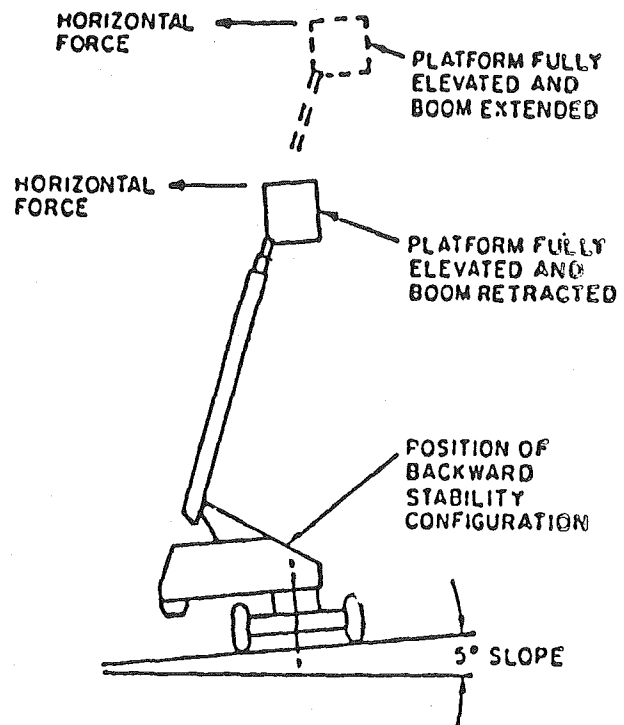


Fig. 1  
Backward Stability - Typical Test Condition

(6) Work platform design requirement. The work platform shall be provided with a guardrail or other structure approximately forty-two inches plus or minus three inches high around its upper periphery, with a midrail, and with toeboards not less than four inches high. Guardrails and midrail chains or the equivalent may be substituted across an access opening.

(a) All stepping, standing, and working surfaces shall be skid resistant.

(b) Attachment points shall be provided for a body belt and lanyard for each person occupying the platform.



(7) Work platform controls. Work platforms shall have both primary and secondary controls.

(a) Primary controls shall be readily accessible to the operator on the platform.

(b) Secondary controls shall be designed to override the primary controls and shall be readily accessible from ground level.

(c) Both primary and secondary controls shall be clearly marked, using permanent legible identification which can be easily understood.

(d) All directional controls shall move in the direction of the function which they control when possible, and shall be of the type which automatically returns to the "off" or the neutral position when released.

(e) Such controls shall be protected against inadvertent operation.

(8) Outrigger interlocks. Where the work platform is equipped with outriggers, stabilizers, or extendable axles, interlocks shall be provided to ensure that the platform cannot be positioned beyond the maximum travel height unless the outriggers, stabilizers, or extendable axles are properly set. Control circuits shall ensure that the driving motor(s) cannot be activated unless the outriggers or stabilizers are disengaged and the platform has been lowered to the maximum travel height (MTH).

(9) Auxiliary operating means: All work platforms shall be provided with an auxiliary means of lowering, retracting, and rotating in the event of primary power loss.

(10) Emergency stop: All work platforms shall be equipped with an emergency stop device, readily accessible to the operator, which will effectively de-energize all powered systems in case of a malfunction.

(11) Tilt alarm: All work platforms shall be fitted with an alarm or other suitable warning at the platform, which will be activated automatically when the machine base is more than five degrees out of level in any direction.

(12) System safety factors.

(a) Where the platform is supporting its rated work load by a system of wire ropes or lift chains, or both, the safety factor of the wire rope or chain shall not be less than eight to one, based on ultimate strength.

(b) All critical components and hoses of hydraulic and pneumatic systems shall have a minimum bursting strength of four times the operating pressure for which the system is designed.

(c) Noncritical components shall have a minimum bursting strength of two times the operating pressure for which the system is designed.

(d) Critical components are defined as those in which a malfunction would result in a free descent of the platform.

(13) Failsafe requirements.

(a) Where the elevation of the platform is accomplished by an electromechanical assembly, the system shall be so designed as to prevent free descent in the event of a generator or power failure.

(b) Where the elevation of the platform is accomplished by a hydraulic or pneumatic cylinder assembly,

the system shall be so equipped as to prevent free descent in the event a hydraulic or pneumatic line bursts.

(c) Hydraulically or pneumatically actuated outriggers or stabilizers, or both, shall be so designed as to prevent their retraction in the event a hydraulic or pneumatic line bursts.

(14) Engine requirement.

(a) Fuel lines of internal-combustion-engine-powered work platforms shall be supported to keep chafing to a minimum and located to keep exposure to engine and exhaust heat to a minimum.

(b) Liquid fuel lines shall be hard except where flexible connections are required for isolation from vibration.

(c) LP gas fuel systems shall use flexible LP gas hose or hard lines.

(d) Exhaust lines shall be equipped with mufflers and shall be located to minimize the exposure to noise and fumes of operators and personnel located in the proximity of such units.

(15) Specifications display. There shall be displayed on all work platforms, in a permanent manner, at a readily visible location, the following information:

(a) Special warnings, cautions, or restrictions necessary for safe operation in accordance with ANSI Z35.1-1972 and Z35.4-1973.

(b) Make, model, serial number, and manufacturer's name and address.

(c) Rated work load.

(d) Maximum platform height and maximum travel height.

(e) Reference to studying operating instructions in manual before use.

(f) Alternative configuration statement. If a work platform is capable of several alternative configurations and loads, the alternatives shall be clearly described.

(g) A clear statement of whether or not the platform and its enclosure are electrically insulated. If they are electrically insulated, the voltage at which the platform is rated and the applicable test standard shall be stated.

(h) The rated work load shall be clearly displayed at each entrance to the platform and the operator control station.

(16) Lift manual requirements. Each work platform shall be provided with a manufacturer's manual(s) containing the following information:

(a) Descriptions, specifications, and ratings of the work platform, including the data specified in subsection (17) of this section.

(b) The maximum hydraulic operating pressure and the maximum voltage of the electrical systems which are part of the platform.

(c) Instructions regarding operation, safety rules, maintenance, and repair.

(d) Replacement parts information.

(17) Inspection and maintenance.

(a) Each work platform shall be inspected, maintained, repaired, and kept in proper working condition in accordance with the manufacturer's maintenance and repair manuals.

(b) Any work platform found not to be in safe operating condition shall be removed from service until repaired.

(c) All repairs shall be made by a qualified person in conformance with the manufacturer's maintenance and repair manual(s).

(18) Operator requirements. Only trained and authorized persons shall be permitted to operate the work platform. Before using the work platform, the operator shall:

(a) Be instructed by a qualified person in the intended purpose and function of each of the controls.

(b) Read and understand the manufacturer's operating instructions and safety rules, or be trained by a qualified person on the contents of the manufacturer's operating instructions and safety rules.

(c) Understand by reading or by having a qualified person explain all decals, warnings, and instructions displayed on the work platform.

(d) Prior to use on each work shift, the work platform shall be inspected for defects that would affect its safe operation and use. The inspection shall consist of the following:

(i) Visual inspection for cracked welds or other structural defects, hydraulic leaks, damaged control cables, loose wire connections, and tire damage.

(ii) Function test of the operating controls to ensure that they perform their intended functions. Any suspect items shall be carefully examined and a determination made by a qualified person as to whether they constitute a safety hazard. All unsafe items shall be corrected before further use of the work platform.

(iii) Before the work platform is used and during use, the job site shall be checked for hazards such as ditches, dropoffs or holes, bumps and floor obstructions, debris, overhead obstructions and high-voltage conductors, and other possible hazardous conditions.

(19) Requirements for operation. The work platform shall be used only in accordance with the manufacturer's operating instructions and safety rules, ANSI 92.6-1979 and this standard.

(a) Only trained and authorized personnel shall be permitted to operate the work platform.

(b) Before each elevation of the work platform, the operator shall:

(i) Check for overhead obstructions and high-voltage conductors. A minimum distance of ten feet from energized high-voltage conductors shall be maintained at all times between the conductors and the operator and platform equipment.

(ii) Ensure the work platform is elevated only on a firm and level surface.

(iii) Ensure that the load and its distribution on the platform are in accordance with the manufacturer's rated capacity. The manufacturer's rated work load shall never be exceeded.

(iv) Ensure that outriggers or stabilizers are used in accordance with manufacturer's instructions.

(v) Ensure that platform guardrails are properly installed and gates or openings are closed.

(vi) Check to see that all occupants' safety belts are on and properly attached.

(c) Before and during driving while elevated, the operator shall:

(i) Be required to look in the direction of, and keep a clear view of, the path of travel and make sure that the path is firm and level.

(ii) Maintain a safe distance from obstacles, debris, dropoffs, holes, depressions, ramps, and other hazards to safe elevated travel.

(iii) Maintain a safe distance from overhead obstacles.

(d) Under all travel conditions the operator shall limit speed according to conditions of ground surface, congestion, slope, location of personnel, and other factors which may create a hazard of collision or injury to personnel.

(e) Stunt driving and horseplay shall not be permitted.

(f) Personnel shall maintain a firm footing on the platform while working thereon. Safety harness and lanyard devices fixed to attachment points provided and approved by the manufacturer shall be used by all occupants. Use of railings, planks, ladders, or any other device on the work platform, except as provided in subsection (24) of this section, shall be prohibited.

(g) The operator shall immediately report to his supervisor any defects or malfunctions which become evident during operation. Any defects or malfunctions that affect the safety of operation shall be repaired prior to continued use of the work platform.

(h) Altering, modifying, or disabling safety devices or interlocks is prohibited.

(i) Care shall be taken to prevent ropes, electric cords, hoses, and the like from becoming entangled in the work platform when it is being elevated, lowered, or moved.

(j) Work platform rated capacities shall not be exceeded when live loads are transferred to the platform at elevated heights.

(k) The operator shall ensure that the area surrounding the work platform is clear of personnel and equipment before lowering the platform.

(20) Refueling: Fuel tanks shall not be filled while the engine is running. Caution shall be used while filling tanks to avoid spilling fuel.

(21) Battery charging: Batteries shall not be charged except in an open, well ventilated area free of flame, smoking, spark, and fire.

(22) Modifications: There shall be no modification or alteration to work platforms without the modifications being approved and certified in writing by the manufacturer or other equivalent entity, such as a nationally recognized testing laboratory, to be in conformance with all applicable provisions of ANSI A92.5-1980 and this standard.

[Statutory Authority: Chapter 49.17 RCW. 89-11-035 (Order 89-03), § 296-155-48529, filed 5/15/89, effective 6/30/89. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-48529, filed 1/21/86.]

**WAC 296-155-48531 Vehicle mounted elevating and rotating aerial devices.** (1) All applicable rules for design, construction, maintenance, operation, testing, and use of vehicle mounted elevating and rotating aerial devices shall be in accordance with ANSI A92.2-1979.

(2) Application: The requirements of this subsection shall be complied with for such equipment as required by the provisions of WAC 296-155-580.

(3) Specification display. The aerial device shall have manufacturers statement clearly stating the minimum values for the following characteristics of vehicles required to provide a stable and structurally sound carrier for the aerial device:

- (a) The front gross axle weight rating (GAWR front).
- (b) The rear gross axle weight rating (GAWR rear).
- (c) The gross vehicle weight rating (GVWR).
- (d) The frame section modulus.
- (e) The yield strength of the vehicle frame.
- (f) The frame resisting bending moment (RBM).
- (g) The wheelbase dimension (WB).
- (h) The rear of cab to rear axle centerline dimension (CA).

(4) Data display: The following information shall be clearly state in the manufacturers manual and on the aerial device.

- (a) Make and model.
- (b) Rated load capacity.
- (c) Aerial device height and reach.
- (d) Maximum pressure of the hydraulic system and voltage of the electrical system.
- (e) Cautions and restrictions of operations.

(5) Types of rated load: Rated load capacity is of two distinct types:

(a) The platform load consisting of the weight of personnel and all items carried on or in the platform.

(b) Supplemental loads which may be fixed directly to the boom(s), or to load-carrying attachments on the aerial device.

(i) The capacity rating in either case shall be designated with boom or booms extended to the position of maximum overturning moment attainable throughout full rotation of the pedestal.

(ii) Capacities of the aerial device in other positions shall be specified separately.

(iii) The manual and placards affixed to the aerial device shall state all applicable capacity ratings.

(6) Multiple configuration rated load. If the aerial device is specified in multiple configurations, these configurations shall be clearly described including the rated load capacity of each, in the manufacturers manual and on the aerial device. Examples of alternate configurations are:

(a) With outriggers extended to firm footing versus outriggers not extended.

(b) With chassis suspension locking device engaged versus disengaged.

(c) With one platform versus more than one platform.

(d) Used as a personnel-carrying device only versus used as a personnel-carrying and material-handling device.

(e) With extensible aerial device retracted or extended.

(f) With digger attached to boom versus with digger removed from boom. If the rated load capacity of the alternate configuration is related to an angle which a boom(s) makes with the horizontal, the manufacturer

shall install a means by which the angle of the boom(s) can be determined.

(7) Maximum elevation determination: Height shall be determined at maximum elevation, from the floor of the platform to the ground, with the aerial device assumed to be mounted on a vehicle having a chassis frame height of thirty-six inches.

(8) Maximum reach determination: Reach, as a maximum, shall be measured in the horizontal plane, from the centerline of rotation to the outer edge (rail) of the platform.

(9) Insulated aerial devices.

(a) The aerial device manufacturers manual and instruction plate(s) shall clearly state whether the aerial device is insulated or noninsulated.

(b) In the case of insulated aerial devices.

(i) The manual and instruction plate(s) shall clearly state the qualification voltage for which the aerial device has been satisfactorily tested in accordance with this standard.

(ii) The manual and instruction plate(s) shall clearly state the design voltage for which the aerial device can be tested.

(iii) All components bridging the insulated portions of the aerial device shall have electrical insulating values consistent with the design voltage rating of the upper boom, and, when provided, of the lower insulator.

(iv) Test electrodes on articulating-boom aerial devices rated over 69 kV, and optionally at 69 kV, shall be installed permanently on the inside and outside surfaces of the insulated portion of the upper boom for the purposes of monitoring electrical leakage current.

(v) The test electrodes shall be two to six inches from the metal portion of the lower end of the insulated upper boom.

(vi) All hydraulic and pneumatic lines bridging the insulated portion of the upper boom shall have metallic couplings which connect the inside and outside of any hose and shall be adjacent to the insulated boom test electrodes.

(vii) The test electrode on the outside surface of the insulated boom on extensible-boom aerial devices shall be removable.

(viii) The location of the removable test electrode shall be permanently marked or recorded to facilitate repeating future tests of the apparatus.

(10) Quality control. The design and manufacture of the aerial device shall comply with the principles outlined in this subsection. The manufacture of the aerial device shall include a quality control system which will ensure compliance with ANSI A92.2-1979 and this standard. The drawings and manual shall specify those welds that are considered critical and that must conform to the following standards:

(a) Structural Welding Code, AWS D1.1-1979.

(b) Specifications for Welding Industrial and Mill Cranes, AWS D14.1-1970.

(c) Standards for Qualifications of Welding Procedures and Welders for Piping and Tubing, AWS D10.9-1969.

(i) The manufacture and installation of aerial devices shall include applicable welding quality control procedures for all weldments.

(ii) Methods of nondestructive testing shall be described in the quality control procedures.

(iii) The quality control procedures shall designate the welds to be examined, the extent of examination, and the method of testing.

(iv) Appropriate inspection methods of welds are recommended by the American Welding Society.

(v) The structural load-supporting elements of the aerial device which support the platform, and which are made of a ductile material, shall have a design stress of not more than fifty percent of the minimum yield strength of the material, based on the combined rated load and weight of the support structure.

(vi) The structural load-supporting elements of the aerial device which support the platform, and which are made of a nonductile material, shall have a design stress of not more than twenty percent of the minimum ultimate strength of the material, based on the combined rated load and weight of the support structure.

(vii) The same structural safety factors stated above shall also apply to the platform.

(11) Aerial lift specification. Articulating-boom and extensible-boom aerial devices primarily designed as personnel carriers shall have both upper and lower controls.

(a) Upper controls shall be in or beside the platform, readily visible to the operator, and protected from damage and inadvertent actuation.

(b) Lower controls shall be easily accessible and shall provide for overriding the upper controls.

(c) These and all other controls shall be plainly identified as to their function.

(d) The controls shall return to their neutral position when released by the operator.

(e) Vehicle-mounted articulating and telescoping cranes or derricks equipped with accessory platforms need not have controls at the platform station.

(f) Aerial ladders that are designed and manufactured with upper controls shall comply with the requirements of this subsection.

(g) Mechanical ladders that are counterbalanced for ease in raising to, and lowering from, an operating position shall be equipped with a locking device to secure the ladder in the lower traveling position.

(h) Each aerial device, when mounted on a vehicle meeting the manufacturer's minimum vehicle specifications, and used in a specific configuration, shall comprise a mobile unit capable of sustaining a static load one and one-half times its rated load capacity, in every position in which the load can be placed within the definition of the specific configuration, when the vehicle is on a firm and level surface. If having the outriggers extended to a firm footing is part of the definition of the configuration, they shall be extended to provide leveling for the purpose of determining whether the mobile unit meets the stability requirements.

(i) Each aerial device, when mounted on a vehicle meeting the manufacturer's minimum vehicle specifications, and used in a specific configuration, shall comprise a mobile unit capable of sustaining a static load one and one-third times its rated load capacity in every position in which the load can be placed within the definition of the specific configuration when the vehicle is on a slope of five degrees downward in the direction most likely to cause overturning. If having the outriggers extended to a firm footing is part of the definition of the configuration, they shall be extended to provide leveling for the purpose of determining whether the mobile unit meets the stability requirements.

(j) If other facilities, such as a means of turntable leveling, are provided to minimize the effect of the sloping surface, then those facilities shall be utilized for the purpose of determining whether the mobile unit meets the stability requirements.

(k) Vertical towers designed specifically for operation only on a level surface shall be excluded from this requirement.

(l) None of the stability tests described in this subsection shall produce instability of the mobile unit as defined herein or cause permanent deformation of any component.

(m) The lifting of a tire or outrigger on the opposite side of the load does not necessarily indicate a condition of instability.

(12) Hydraulic components.

(a) All hydraulic components whose failure could result in free and unrestricted motion of the boom(s) shall have a minimum bursting strength of at least four times the operating pressure for which the system is designed.

(b) All hydraulic components normally rated according to bursting strength, such as hose, tubing, and fittings, shall have a minimum bursting strength of at least three times the operating pressure for which the system is designed.

(c) All hydraulic components normally rated according to performance criteria, such as rated flow and pressure, life cycles, pressure drop, rpm, torque, and speed, shall have a minimum bursting strength of at least two times the operating pressure for which the system is designed. Such components generally include pumps, motors, directional controls, and similar functional components.

(13) Power failure.

(a) Where the operation of the aerial device is accomplished by hydraulic means, the system shall be equipped with appropriate devices to prevent free and unrestricted motion of the aerial device in the event of hydraulic line failure.

(b) Where the operation of the aerial device is accomplished electrically, the system shall be designed to prevent free and unrestricted motion in the event of generator or power failure.

(c) This protection shall also apply to components used to stabilize a mobile unit where a system failure would result in instability.

(14) Platforms.

(a) Platform walls shall be approximately forty-two inches plus or minus three inches high when buckets or baskets are used as platforms, or the platforms shall be provided with a rail or other device around the periphery that also shall be approximately forty-two inches plus or minus three inches above the floor with a midrail and a kick plate that is at least four inches high, or its equivalent.

(b) A means shall be provided that allows personnel to attach a safety strap or lanyard to the platform or boom.

(c) Steps of all platforms shall be provided with non-skid surfaces.

(d) The platform wall height of any unit made in conformance with ANSI A92.2-1979 shall be acceptable.

(e) After the effective date of this standard, units shall conform to the requirements of this subsection.

(f) Platforms with folding-type floors and steps or rungs may be used without rails and kick plates if a method is provided to allow personnel equipped with a body belt and safety strap or lanyard to attach themselves to the platform or boom.

(g) Platforms for aerial ladders shall have a kick plate at least four inches high or its equivalent, around three sides of the platform.

(h) Provision shall be made to allow personnel equipped in accordance with WAC 296-155-225 with a body belt and safety strap or lanyard to attach themselves to the ladder rail.

(15) Specifications display. The aerial device shall have identification, operation, and instruction placards, decals, plates, or the equivalent, which are legible, permanent, and readily visible. There shall be installed on each aerial device applicable markings or provide these markings with appropriate installation instructions. The markings on the aerial device shall not be removed, defaced, or altered. All missing or defective markings shall be replaced.

(a) An aerial device shall have the following markings:

- (i) Identification markings.
- (ii) Operation markings.
- (iii) Instruction markings.

(b) Aerial devices shall have markings to indicate the following:

- (i) Make.
- (ii) Model.
- (iii) Insulated or noninsulated.
- (iv) Qualification voltage and date of test.
- (v) Serial number.
- (vi) Rated load capacity.
- (vii) Height.

(viii) Aerial device system pressure or aerial device system voltage, or both.

(c) Aerial devices shall have markings describing the function of each control. Markings shall be determined by the manufacturer or the manufacturer and user jointly to indicate hazards inherent in the operation of an aerial device and those hazards for which the aerial device does not provide protection. The following instruction markings shall be provided for:

(i) Electrical hazards involved in the operation of the machine to warn that an aerial device does not provide protection to the operator from contact with or in proximity to an electrically charged conductor when he is in contact with or in proximity to another conductor.

(ii) Electrical hazards involved in the operation of the machine to warn that an aerial device, when working on or in proximity to energized conductors, shall be considered energized, and that contact with the aerial device or vehicle under those conditions may cause serious injuries.

(iii) Hazards that result from failure to operate the equipment in a prescribed manner.

(iv) Information related to the use and load rating of the equipment for material handling.

(v) Information related to the use and load rating of the aerial device for alternate configurations.

(vi) Information related to operator cautions.

(d) The color, format, and substance shall conform to:

(i) American National Standard for Accident Prevention Signs, ANSI Z35.1-1972.

(ii) American National Standard for Accident Prevention Tags, ANSI Z35.2-1968.

(iii) American National Standard for Informational Signs Complementary to ANSI Z35.1-1972 Accident Prevention Signs, ANSI Z35.4-1973.

(16) Testing of new aerial devices: In addition to the manufacturer's prototype tests and quality control measures, each new aerial device, including mechanisms, shall be tested to the extent necessary to ensure compliance with the operational requirements of this subsection.

(a) Operational tests shall include the following:

- (i) Boom(s) elevating and lowering mechanism.
- (ii) Boom extension mechanism.
- (iii) Rotating mechanism.
- (iv) Stability tests.
- (v) Safety devices.

(b) A visual inspection of the finished unit shall be made to determine whether the operational test has produced an adverse effect on any component. Whoever mounts an aerial device upon a vehicle shall, before the mobile unit is placed in operation, perform stability tests in accordance with the requirements of subsection (11) of this section, and the operational and visual tests in accordance with this subsection.

(17) Electrical tests: All electrical tests shall be performed in accordance with ANSI A92.2-1979.

(18) Test reports: A certified report of the tests, specified in this subsection, signed by a registered professional engineer, or an equivalent entity shall be provided with each unit.

(19) Manual requirement: Aerial devices shall comply with the requirements of this standard and shall be provided with manuals. The manuals shall contain:

(a) Descriptions, specifications, and ratings of the aerial device.

(b) The maximum system pressure and the maximum voltage of electrical systems which are part of the aerial device.

(c) Instructions regarding operation, maintenance, and specified welds.

(d) Replacement part information.

(e) Instructions for installing or mounting the aerial device.

(20) Inspections:

(a) Prior to initial use, all new or modified mobile units shall be inspected and tested by the owners and users to ensure compliance with the provisions of this standard and ANSI A92.2-1979.

(b) The inspection procedure for mobile units in regular service is divided into two classifications based upon the intervals at which inspections and tests shall be performed. Safe intervals shall be set by the user, within the limits recommended by the manufacturer, and are dependent upon the nature of the critical components of the mobile unit and the degree of their exposure to wear, deterioration, or malfunction. The two classifications are designated as "frequent" and "periodic" with respective intervals between inspections and tests, as defined below:

(i) Frequent inspection and test: Daily to monthly intervals, or before use, if not used regularly.

(ii) Periodic inspection and test: One to twelve month intervals.

(21) Frequent inspections: Items such as, but not limited to the following shall be inspected for defects at the intervals as defined in subsection (20)(b)(i) of this section or as specifically indicated, including observation during operation, for any defects which might appear between regular inspections. These tests and inspections shall be performed by the operator. Any suspected items shall be carefully examined and a determination made by a qualified person as to whether they constitute a safety hazard. All unsafe items shall be corrected before further use.

(a) Operating controls and associated mechanisms for conditions interfering with proper operation.

(b) Operating controls and associated mechanisms for excessive component wear and contamination by foreign material.

(c) Visual and audible safety devices for malfunction.

(d) Hydraulic or pneumatic systems for observable deterioration or excessive leakage.

(e) Fiberglass and other insulating components for visible damage or contamination.

(f) Electrical apparatus for malfunction, signs of excessive, dirt, and moisture accumulation.

(22) Periodic inspection. An inspection of the mobile unit shall be performed at the intervals defined in subsection (20)(b)(ii) of this section, depending upon its activity, severity of service, and environment, or as specifically indicated below. Any suspect items shall be carefully examined and a determination made by a qualified person as to whether they constitute a safety hazard. All unsafe items shall be corrected before further use. Nondestructive inspection and testing methods shall be used where there are questionable structural components.

(a) Deformed, cracked, or corroded members in the aerial device structure.

(b) Worn, cracked or distorted parts, such as pins, bearings, shafts, gears, rollers, locking devices, chains, chain sprockets, wire ropes, and sheaves.

(c) Hydraulic and pneumatic relief valve settings.

(d) Hydraulic system for proper oil level.

(e) Hydraulic and pneumatic fittings, hoses, and tubing for evidence of leakage, abnormal deformation, or excessive abrasion.

(f) Compressors, pumps, motors, and generators for loose fasteners, leaks, unusual noises or vibrations, loss of operating speed, and excessive heating.

(g) Hydraulic and pneumatic valves for cracks in the valve housing, leaks, and sticking spools.

(h) Hydraulic and pneumatic cylinders and holding valves for malfunction and visible damage.

(i) Hydraulic and pneumatic filters for cleanliness and the presence of foreign material in the system indicating other component deterioration.

(j) Performance test of all boom movements.

(k) Condition and tightness of bolts and other fasteners.

(l) Welds, as specified by the manufacturer.

(m) Legible and proper markings of controls, ratings, and instructions.

(23) Electrical insulation rating tests: If the aerial device is considered, rated, and used as an insulated device, the electrical insulating components and system, after a thorough inspection for lack of cleanliness and other hazards, shall be tested for compliance with the rating of the aerial device in accordance with one of the following applicable methods and procedures:

(a) In accordance with section 5.2 of ANSI A92.2-1979 where adequate test facilities are available.

(b) In the field if the aerial device is equipped with electrical test electrodes. The insulated boom may be raised into a high voltage line whose voltage is as high as or higher than the voltage to be worked but not exceeding the design voltage of the aerial device. The electrical leakage current shall not exceed 1 microampere per line to ground per kilovolt applied.

(c) For units rated 69 kV and under, by placing a fused and protected ammeter in the circuit between a test powerline and the conductive metal assembly at the bucket end of the insulated boom.

(i) The lower end of the boom section to be tested shall be grounded.

(ii) The ammeter shall be shielded from any stray electrical currents, and shall give the measurement of any leakage current across the boom and controls, or any capacitive currents involved from the platform to ground, or both.

(iii) The minimum voltage of the test line shall be that of any circuit on which the aerial device is to be used but not exceeding the design voltage of the aerial device.

(iv) During a three minute test period, the total current through the ammeter shall not exceed the following limits at the corresponding rated line voltages:



Line Voltage (kV)	Maximum Current (Microamperes)
69	1000
34.5	500
13.2	200

(d) For units rated 69 kV and under and not used for bare hand application, a dc test voltage and procedure shall be used. The dc potential and leakage current limit shall be specified by the aerial device manufacturer or an equivalent entity.

(e) For platform liners, a retest at seventy percent of the original factory test voltage in accordance with the procedures of section 5.2.2.5 of ANSI A92.2-1979, or the equivalent shall be made.

(f) All electrical tests shall be performed only by qualified persons who are aware of the dangers.

(24) Inspection documentation:

(a) A check sheet or list of items to be inspected shall be provided to the operator or other authorized person for use in making frequent inspections. Records of frequent inspections need not be made. However, where a safety hazard is found, it shall be reported in writing to a person responsible for the corrective action and that report and a record of the correction shall be maintained.

(b) Written, dated, and signed reports and records shall be made of periodic inspections and tests and retained for a period of time consistent with need. Records shall be readily available. Manufacturer's recommendations as to the necessity and frequency of maintenance shall be followed.

(25) Modifications: No modifications or additions which affect the mechanical, hydraulic, or electrical integrity or the safe operation of the aerial device shall be made without the written approval of the manufacturer or an equivalent entity.

(a) If such modification or changes are made, the capacity, operation, and maintenance instruction markings shall be changed accordingly.

(b) In no case shall the safety factors be reduced below those specified in this standard, ANSI A92.2-1979, or below the manufacturer's design factors, whichever are greater.

(c) Changes in loading or additions made to the mobile unit after the final acceptance that affect weight distribution shall meet applicable loading regulations of the National Traffic and Motor Vehicle Safety Act of 1966 sections on Certification.

(26) Qualified operators: The user shall select and authorize only those persons qualified by training or experience, or both, to operate the aerial devices. Each operator shall be instructed in the safe and proper operation of the aerial device in accordance with the manufacturer's operator's manual and the user's work instructions.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-48531, filed 1/21/86.]

**WAC 296-155-48533 Crane or derrick suspended personnel platforms.** (1) Scope, application, and definitions.

(a) Scope and application. This standard applies to the design, construction, testing, use and maintenance of personnel platforms, and the hoisting of personnel platforms on the load lines of cranes or derricks.

(b) Definitions. For the purposes of this section, the following definitions apply:

(i) "Failure" means load refusal, breakage, or separation of components.

(ii) "Hoist" (or hoisting) means all crane or derrick functions such as lowering, lifting, swinging, booming in and out or up and down, or suspending a personnel platform.

(iii) "Load refusal" means the point where the ultimate strength is exceeded.

(iv) "Maximum intended load" means the total load of all employees, tools, materials, and other loads reasonably anticipated to be applied to a personnel platform or personnel platform component at any one time.

(v) "Runway" means a firm, level surface designed, prepared, and designated as a path of travel for the weight and configuration of the crane being used to lift and travel with the crane suspended platform. An existing surface may be used as long as it meets these criteria.

(2) General requirements. The use of a crane or derrick to hoist employees on a personnel platform is prohibited, except when the erection, use, and dismantling of conventional means of reaching the worksite, such as a personnel hoist, ladder, stairway, aerial lift, elevating work platform or scaffold, would be more hazardous, or is not possible because of structural design or worksite conditions.

(3) Cranes and derricks.

(a) Operational criteria.

(b) Hoisting of the personnel platform shall be performed in a slow, controlled, cautious manner with no sudden movements of the crane or derrick, or the platform.

(c) Load lines shall be capable of supporting, without failure, at least seven times the maximum intended load, except that where rotation resistant rope is used, the lines shall be capable of supporting without failure, at least ten times the maximum intended load. The required design factor is achieved by taking the current safety factor of 3.5 (required under WAC 296-155-525 (3)(b)) and applying the fifty percent derating of the crane capacity which is required by (g) of this subsection.

(d) Load and boom hoist drum brakes, swing brakes, and locking devices such as pawls or dogs shall be engaged when the occupied personnel platform is in a stationary working position.

(e) The load line hoist drum shall have a system or device on the power train, other than the load hoist brake, which regulates the lowering rate of speed of the hoist mechanism (controlled load lowering). Free fall is prohibited.



(f) The crane shall be uniformly level within one percent of level grade and located on firm footing. Cranes equipped with outriggers shall have them all fully deployed following manufacturer's specifications, insofar as applicable, when hoisting employees.

(g) The total weight of the loaded personnel platform and related rigging shall not exceed fifty percent of the rated capacity for the radius and configuration of the crane or derrick.

(h) The use of machines having live booms (booms in which lowering is controlled by a brake without aid from other devices which slow the lowering speeds) is prohibited.

(i) Multiple-part line block: When a multiple-part line block is in use, a substantial strap shall be used between the crane hook and common ring, shackle, or other equivalent device, to eliminate employee exposure to the lines running through the block, and to the block itself.

#### (4) Instruments and components.

(a) Cranes and derricks with variable angle booms shall be equipped with a boom angle indicator, readily visible to the operator.

(b) Cranes with telescoping booms shall be equipped with a device to indicate clearly to the operator, at all times, the boom's extended length, or an accurate determination of the load radius to be used during the lift shall be made prior to hoisting personnel.

(c) A positive acting device shall be used which prevents contact between the load block or overhaul ball and the boom tip (anti-two-blocking device), or a system shall be used which deactivates the hoisting action before damage occurs in the event of a two-blocking situation (two block damage prevention feature).

#### (5) Rigging.

(a) Lifting bridles on box-type platforms shall consist of four legs of equal length, with one end securely shackled to each corner of the platform and the other end securely attached to a common ring, shackle, or other equivalent device to accommodate the crane hook, or a strap to the crane hook.

(b) Shackle bolts used for rigging of personnel platforms shall be secured against displacement.

(c) A substantial safety line shall pass through the eye of each leg of the bridle adjacent to the common ring, shackle, or equivalent device.

(d) Securely fastened with a minimum amount of slack to the lift line above the headache ball or to the crane hook itself.

(e) All eyes in wire rope slings shall be fabricated with thimbles.

(f) Wire rope, shackles, rings, master links, and other rigging hardware must be capable of supporting, without failure, at least five times the maximum intended load applied or transmitted to that component. Where rotation resistant wire rope is used for slings, they shall be capable of supporting without failure at least ten times the maximum intended load.

(g) Hooks on headache ball assemblies, lower load blocks, or other attachment assemblies shall be of a type

that can be closed and locked, eliminating the hook throat opening. Alternatively, an alloy anchor type shackle with a bolt, nut and retaining pin may be used, or the hook shall be moused.

(h) Bridles and associated rigging for attaching the personnel platform to the hoist line shall be used only for the platform and the necessary employees, their tools and the materials necessary to do their work, and shall not be used for any other purpose when not hoisting personnel.

#### (6) Personnel platforms - design criteria.

(a) The personnel platform and suspension system shall be designed by a qualified engineer or a qualified person competent in structural design.

(b) The suspension system shall be designed to minimize tipping of the platform due to movement of employees occupying the platform.

(c) The personnel platform itself, except the guardrail system and body belt/harness anchorages, shall be capable of supporting, without failure, its own weight and at least five times the maximum intended load based on a minimum allowance of five hundred pounds for the first person with light tools, and an additional two hundred fifty pounds for each additional person.

(d) Criteria for guardrail systems and body belt/harness anchorages are contained in WAC 296-155-225(4) and 296-155-505(6) respectively.

(e) The personnel platform shall be conspicuously posted with a plate or other permanent marking which indicates the weight of the platform and its rated load capacity or maximum intended load.

#### (7) Platform specifications.

(a) Each personnel platform shall be equipped with a guardrail system which meets the requirements of WAC 296-155-505(6) and, shall be enclosed at least from the toeboard to mid-rail with either solid construction or expanded metal having openings no greater than one-half inch (1.27 cm).

(b) A grab rail shall be installed inside the entire perimeter of the personnel platform.

(c) Access gates, if installed, shall not swing outward during hoisting.

(d) Access gates, including sliding or folding gates, shall be equipped with a restraining device to prevent accidental opening.

(e) Headroom shall be provided which allows employees to stand upright in the platform.

(f) In addition to the use of hard hats, employees shall be protected by overhead protection on the personnel platform when employees are exposed to falling objects.

(g) All rough edges exposed to contact by employees shall be surfaced or smoothed in order to prevent injury to employees from punctures or lacerations.

(h) All welding of the personnel platform and its components shall be performed by a qualified welder familiar with the weld grades, types, and material specified in the platform design.

(i) Occupants of all personnel platforms shall wear a safety belt or harness and lanyard which meets the requirements of WAC 296-155-225 (3) through (8).

(j) Box-type platform: The workers lanyard shall be secured to an anchorage within the platform meeting the requirements of WAC 296-155-225(4).

(k) Rescue platform:

(i) If the platform is used as a rescue vehicle, the injured worker shall be strapped into the stretcher or basket.

(ii) The basket shall then be secured by lanyard to an anchorage within the platform meeting the requirements of WAC 296-155-225(4).

(l) Boatswains chair: The workers lanyard shall be secured to the lift line above the headache ball or to the crane hook itself.

(m) Barrel-type platform:

(i) The workers lanyard shall be secured to the lift line above the headache ball or to the crane hook itself.

(ii) A solid bar or rod shall be substantially attached in a rigid position to the bottom or side of the platform.

(iii) The bottom of the barrel-type platform shall be of a convex shape to cause the platform to lay on its side when lowered to the ground or floor.

(iv) The bar or rod shall extend a minimum of eight feet above the floor of the platform.

(8) Personnel platform loading.

(a) The personnel platform shall not be loaded in excess of its rated load capacity.

(b) The number of employees occupying the personnel platform shall not exceed the number required for the work being performed.

(c) Personnel platforms shall be used only for employees, their tools, and the materials necessary to do their work, and shall not be used to hoist only materials or tools when not hoisting personnel.

(d) Materials and tools for use during a personnel lift shall be secured to prevent displacement.

(e) Materials and tools for use during a personnel lift shall be evenly distributed within the confines of the platform while the platform is suspended.

(9) Trial lift, inspection, and proof testing.

(a) A trial lift with the unoccupied personnel platform loaded at least to the anticipated liftweight shall be made from ground level, or any other location where employees will enter the platform, to each location at which the personnel platform is to be hoisted and positioned. This trial lift shall be performed immediately prior to placing personnel on the platform. The operator shall determine that all systems, controls, and safety devices are activated and functioning properly; that no interferences exist; and that all configurations necessary to reach those work locations will allow the operator to remain under the fifty percent limit of the hoist's rated capacity. Materials and tools to be used during the actual lift can be loaded in the platform, as provided in subsection (8)(d) and (e) of this section for the trial lift. A single trial lift may be performed at one time for all locations that are to be reached from a single set-up position.

(b) The trial lift shall be repeated prior to hoisting employees whenever the crane or derrick is moved and set up in a new location or returned to a previously used location. Additionally, the trial lift shall be repeated

when the lift route is changed unless the operator determines that the route change is not significant (i.e., the route change would not affect the safety of hoisted employees).

(c) After the trial lift, and just prior to hoisting personnel, the platform shall be hoisted a few inches and inspected to ensure that it is secure and properly balanced. Employees shall not be hoisted unless the following conditions are determined to exist:

(i) Hoist ropes shall be free of kinks;

(ii) Multiple part lines shall not be twisted around each other;

(iii) The primary attachment shall be centered over the platform; and

(iv) The hoisting system shall be inspected if the load rope is slack to ensure all ropes are properly stated on drums and in sheaves.

(d) A visual inspection of the crane or derrick, rigging, personnel platform, and the crane or derrick base support or ground shall be conducted by a competent person immediately after the trial lift to determine whether the testing has exposed any defect or produced any adverse effect upon any component or structure.

(e) Any defects found during inspections which create a safety hazard shall be corrected before hoisting personnel.

(f) At each job site, prior to hoisting employees on the personnel platform, and after any repair or modification, the platform and rigging shall be proof tested to one hundred twenty-five percent of the platform's rated capacity by holding it in a suspended position for five minutes with the test load evenly distributed on the platform (this may be done concurrently with the trial lift). After proof testing, a competent person shall inspect the platform and rigging. Any deficiencies found shall be corrected and another proof test shall be conducted. Personnel hoisting shall not be conducted until the proof testing requirements are satisfied.

(10) Work practices.

(a) Employees shall keep all parts of the body inside the platform during raising, lowering, and positioning. This provision does not apply to an occupant of the platform performing the duties of a signal person.

(b) Before employees exit or enter a hoisted personnel platform that is not landed, the platform shall be secured to the structure where the work is to be performed, unless securing to the structure creates an unsafe situation.

(c) Tag lines shall be used unless their use creates an unsafe condition.

(d) The crane or derrick operator shall remain at the controls at all times when the crane engine is running and the platform is occupied.

(e) Hoisting of employees shall be promptly discontinued upon indication of any dangerous weather conditions or other impending danger.

(f) Employees being hoisted shall remain in continuous sight of and in direct communication with the operator or signal person. In those situations where direct visual contact with the operator is not possible, and the use of a signal person would create a greater hazard for

that person, direct communication alone such as by radio may be used.

(g) Hand signals to the operator shall be in accordance with WAC 296-155-525 (1)(c).

(h) Except over water, employees occupying the personnel platform shall use a body belt/harness system with lanyard appropriately attached to the lower load block or overhaul ball, or to a structural member within the personnel platform capable of supporting a fall impact for employees using the anchorage. When working over water, the requirements of WAC 296-155-235 shall apply.

(i) No lifts shall be made on another of the crane's or derrick's load lines while personnel are suspended on a platform.

(11) Traveling.

(a) Hoisting of employees while the crane is traveling is prohibited, except for portal, tower and locomotive cranes, or where the employer demonstrates that there is no less hazardous way to perform the work.

(b) Under any circumstances where a crane would travel while hoisting personnel, the employer shall implement the following procedures to safeguard employees:

(i) Crane travel shall be restricted to a fixed track or runway;

(ii) Travel shall be limited to the load radius of the boom used during the lift; and

(iii) The boom must be parallel to the direction of travel.

(c) A complete trial run shall be performed to test the route of travel before employees are allowed to occupy the platform. This trial run can be performed at the same time as the trial lift required by subsection (9)(a) of this section which tests the route of the lift.

(d) If travel is done with a rubber tired-carrier, the condition and air pressure of the tires shall be checked. The chart capacity for lifts on rubber shall be used for application of the fifty percent reduction of rated capacity. Notwithstanding subsection (3)(f) of this section, outriggers may be partially retracted as necessary for travel.

(12) Prelift meeting.

(a) A meeting attended by the crane or derrick operator, signal person(s) (if necessary for the lift), employee(s) to be lifted, and the person responsible for the task to be performed shall be held to review the appropriate requirements of this section and the procedures to be followed.

(b) This meeting shall be held prior to the trial lift at each new work location, and shall be repeated for any employees newly assigned to the operation.

[Statutory Authority: Chapter 49.17 RCW. 89-11-035 (Order 89-03), § 296-155-48533, filed 5/15/89, effective 6/30/89. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-48533, filed 1/21/86.]

**WAC 296-155-48536 Forklift elevated work platforms.** When a forklift truck is used for elevating workers a platform shall be specifically built for that purpose and shall comply with the following requirements:

(1) The platform shall be securely attached to the forks and shall have standard guardrails and toeboards on all open sides.

(2) The hydraulic system of the forklift shall be so designed that the lift mechanism will not drop faster than one hundred thirty-five feet per minute in the event of a failure in any part of the system. Forklifts used for elevating platforms shall be identified that they are so designed.

(3) A safety strap shall be installed or the control lever shall be locked to prevent the boom from tilting.

(4) An operator shall be at the controls of the forklift equipment while persons are on the platform.

(5) The operator shall be in the normal operating position while raising or lowering the platform.

(6) The vehicle shall not travel from point to point while workers are on the platform except that inching or maneuvering at very slow speed is permissible.

(7) The area between workers on the platform and the mast shall be adequately guarded to prevent contact with chains or other shear points.

(8) All platforms shall be visually inspected daily or before each use by the person in charge of the work being performed, and shall be tested as frequently as is necessary to maintain minimum safety factors.

[Statutory Authority: Chapter 49.17 RCW. 89-11-035 (Order 89-03), § 296-155-48536, filed 5/15/89, effective 6/30/89.]

## Part K

### FLOOR OPENINGS, WALL OPENINGS AND STAIRWAYS

#### WAC

296-155-500	Definitions applicable to this part.
296-155-505	Guardrails, handrails, and covers.
296-155-50501	Appendix—Roofs.
296-155-50503	Roofing brackets.
296-155-50505	Roofing, insulating and waterproofing.
296-155-510	Stairways.
296-155-515	Ramps, runways, and inclined walkways.

**WAC 296-155-500 Definitions applicable to this part.** (1) "Built-up-roofing" means a weatherproofing cover, applied over roof decks, consisting of either a liquid-applied system, a single-ply system, or a multiple-ply system. Liquid-applied systems generally consist of silicone rubber, plastics, or similar material applied by spray or roller equipment. Single-ply systems generally consist of a single layer of synthetic rubber, plastic, or similar material, and a layer of adhesive. Multiple-ply systems generally consist of layers of felt and bitumen, and may be covered with a layer of mineral aggregate.

(2) "Built-up-roofing work" means the hoisting, storage, application, and removal of built-up roofing materials and equipment, including related insulation, sheet metal, and vapor barrier work, but not including the construction of the roof deck.

(3) "Floor hole" means an opening measuring less than 12 inches but more than 1 inch in its least dimension in any floor, roof, or platform through which materials but not persons may fall, such as a belt hole, pipe opening, or slot opening.

(4) "Floor opening" means an opening measuring 12 inches or more in its least dimension in any floor, roof, or platform, through which persons may fall.

(5) "Handrail" means a single bar or pipe supported on brackets from a wall or partition, as on a stairway or ramp, to furnish persons with a handhold in case of tripping.

(6) "Low-pitched roof" means a roof having a slope less than or equal to four in twelve.

(7) "Mechanical equipment" means all motor or human propelled wheeled equipment except for wheelbarrows and mopcars.

(8) "MSS systems" (motion-stopping-safety systems) means fall protection using the following equipment singly or in combination: Standard railings (guardrails) as described in WAC 296-155-505(6); scaffolds or platforms with guardrails as described in WAC 296-155-485; safety nets as described in WAC 296-155-230; and safety belt systems as described in WAC 296-155-225.

(9) "Nose, nosing" means that portion of a tread projecting beyond the face of the riser immediately below.

(10) "Platform" means a working space for persons, elevated above the surrounding floor or ground, such as a balcony or platform for the operation of machinery and equipment.

(11) "Rise" means the vertical distance from the top of a tread to the top of the next higher tread.

(12) "Roof" means the exterior surface on the top of a building. This does not include floors which, because a building has not been completely built, temporarily become the top surface of a building.

(13) "Runway" means a passageway for persons, elevated above the surrounding floor or ground level, such as a footwalk along shafting or a walkway between buildings.

(14) "Safety-monitoring system" means a safety system in which a competent person monitors the safety of all employees in a roofing crew, and warns them when it appears to the monitor that they are unaware of the hazard or are acting in an unsafe manner. The competent person must be on the same roof and within visual distance of the employees, and must be close enough to verbally communicate with the employees.

(15) "Stair platform" means an extended step or landing breaking a continuous run of stairs.

(16) "Stair railing" means a vertical barrier erected along exposed sides of a stairway to prevent falls of persons.

(17) "Stairs, stairways" means a series of steps leading from one level or floor to another, or leading to platforms, pits, boiler rooms, crossovers, or around machinery, tanks, and other equipment that are used more or less continuously or routinely by employees or only occasionally by specific individuals. For the purpose of this part, a series of steps and landings having three or more rises constitutes stairs or stairway.

(18) "Standard railing" means a vertical barrier erected along exposed edges of a floor opening, wall opening, ramp, platform, or runway to prevent falls of persons.

(19) "Standard strength and construction" means any construction of railings, covers, or other guards that meets the requirements of this part.

(20) "Toeboard" means a vertical barrier at floor level erected along exposed edges of a floor opening, wall opening, platform, runway, or ramp to prevent falls of materials.

(21) "Tread width" means the horizontal distance from front to back of tread, including nosing, when used.

(22) "Unprotected side or edge" means any side or edge of a roof perimeter where there is no wall three feet (.9 meters) or more in height.

(23) "Wall opening" means an opening at least 30 inches high and 18 inches wide, in any wall or partition, through which persons may fall, such as an opening for a window, a yard-arm doorway or chute opening.

(24) "Work area" means that portion of a roof where built-up roofing work is being performed.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-500, filed 1/21/86. Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-13-053 (Order 81-9), § 296-155-500, filed 6/17/81; Order 74-26, § 296-155-500, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-505 Guardrails, handrails, and covers.** (1) General provisions. This part applies to temporary or emergency conditions where there is danger of employees or materials falling through floor, roof, or wall openings, or from stairways, runways, ramps, open sided floors, open sides of structures, bridges, or other open sided walking or working surfaces. When guardrails or covers required by this section must be temporarily removed to perform a specific task, the area shall be constantly attended by a monitor to warn others of the hazard or shall be protected by a movable barrier.

(2) Guarding of floor openings and floor holes.

(a) Floor openings shall be guarded by a standard railing and toe boards or cover, as specified in subsections (2)(g) and (6) of this section. In general, the railing shall be provided on all exposed sides, except at entrances to stairways. All vehicle service pits shall have a cover or removable type standard guardrail. When not in use, pits shall be covered or guarded. Where vehicle service pits are to be used again immediately, and the service man is within a 50 foot distance of the unguarded pit and also within line of sight of the unguarded pit, the cover or guardrail need not be replaced between uses. Where vehicle service pits are used frequently, the perimeters of the pits shall be delineated by high visibility, luminescent, skid resistant paint. Such painted delineation shall be kept clean and free of extraneous materials.

(b) Ladderway floor openings or platforms shall be guarded by standard railings with standard toe boards on all exposed sides, except at entrance to opening, with the passage through the railing either provided with a swinging gate or so offset that a person cannot walk directly into the opening.

(c) Hatchways and chute floor openings shall be guarded by one of the following:

(i) Hinged covers of standard strength and construction and a standard railing with only one exposed side.

When the opening is not in use, the cover shall be closed or the exposed side shall be guarded at both top and intermediate positions by removable standard railings;

(ii) A removable standard railing with toe board on not more than two sides of the opening and fixed standard railings with toe boards on all other exposed sides. The removable railing shall be kept in place when the opening is not in use and shall be hinged or otherwise mounted so as to be conveniently replaceable.

(d) Wherever there is danger of falling through a skylight opening, and the skylight itself is not capable of sustaining the weight of a two hundred pound person with a safety factor of four, standard guardrails shall be provided on all exposed sides or the skylight shall be covered in accordance with (g) of this subsection.

(e) Pits and trap-door floor openings shall be guarded by floor opening covers of standard strength and construction. While the cover is not in place, the pit or trap openings shall be protected on all exposed sides by removable standard railings.

(f) Manhole floor openings shall be guarded by standard covers which need not be hinged in place. While the cover is not in place, the manhole opening shall be protected by standard railings.

(g) All floor opening covers shall be capable of supporting the maximum potential load but never less than two hundred pounds (with a safety factor of four).

(i) The cover shall be recessed to conform to the level of the surrounding floor or to be flush with the perimeter of the opening.

(ii) The cover shall be secured by fastening devices to prevent unintentional removal.

(iii) If it becomes necessary to remove the cover, a monitor shall remain at the opening until the cover is replaced. The monitor shall advise persons entering the area of the hazard, shall prevent exposure to the fall hazard and shall perform no other duties.

(h) Floor holes, into which persons can accidentally walk, shall be guarded by either a standard railing with standard toe board on all exposed sides, or a floor hole cover of standard strength and construction that is secured against accidental displacement. While the cover is not in place, the floor hole shall be protected by a standard railing.

(i) Where doors or gates open directly on a stairway, a platform shall be provided, and the swing of the door shall not reduce the effective width of the platform to less than 20 inches.

### (3) Guarding of wall openings.

(a) Wall openings, from which there is a drop of more than 4 feet, and the bottom of the opening is less than 3 feet above the working surface, shall be guarded as follows:

(i) When the height and placement of the opening in relation to the working surface is such that either a standard rail or intermediate rail will effectively reduce the danger of falling, one or both shall be provided;

(ii) The bottom of a wall opening, which is less than 4 inches above the working surface, regardless of width,

shall be protected by a standard toe board or an enclosing screen either of solid construction or as specified in (6)(g)(ii) of this section.

(b) An extension platform, outside a wall opening, onto which materials can be hoisted for handling shall have standard guardrails on all exposed sides or equivalent. One side of an extension platform may have removable railings in order to facilitate handling materials.

(c) When a chute is attached to an opening, the provisions of (a) of this subsection shall apply, except that a toe board is not required.

### (4) Guarding of open-sided surfaces.

(a) Every open-sided floor, platform or surface four feet or more above adjacent floor or ground level shall be guarded by a standard railing, or the equivalent, as specified in subsection (6)(a) of this section, on all open sides, except where there is entrance to a ramp, stairway, or fixed ladder. The railing shall be provided with a standard toe board wherever, beneath the open sides, persons can pass, or there is moving machinery, or there is equipment with which falling materials could create a hazard.

(b) Runways shall be guarded by a standard railing, or the equivalent, as specified in subsection (6) of this section, on all open sides, 4 feet or more above floor or ground level. Wherever tools, machine parts, or materials are likely to be used on the runway, a toe board shall also be provided on each exposed side.

(c) Runways used exclusively for special purposes may have the railing on one side omitted where operating conditions necessitate such omission, providing the falling hazard is minimized by using a runway not less than 18 inches wide.

(d) Where employees entering upon runways become thereby exposed to machinery, electrical equipment, or other danger not a falling hazard, additional guarding shall be provided.

(e) Regardless of height, open-sided floors, walkways, platforms, or runways above or adjacent to dangerous equipment, pickling or galvanizing tanks, degreasing units, and similar hazards, shall be guarded with a standard railing and toe board.

(f) Open sides of gardens, patios, recreation areas and similar areas located on roofs of buildings or structures shall be guarded by permanent standard railings or the equivalent. Where a planting area has been constructed adjacent to the open sides of the roof and the planting area is raised above the normal walking surface of the roof area, the open side of the planting area shall also be protected with standard railings or the equivalent.

### (5) Stairway railings and guards.

(a) Every flight of stairs having four or more risers shall be equipped with standard stair railings or standard handrails as specified below, the width of the stair to be measured clear of all obstructions except handrails:

(i) On stairways less than 44 inches wide having both sides enclosed, at least one handrail, preferably on the right side descending;

(ii) On stairways less than 44 inches wide having one side open, at least one stair railing on the open side;

(iii) On stairways less than 44 inches wide having both sides open, one stair railing on each side;

(iv) On stairways more than 44 inches wide but less than 88 inches wide, one handrail on each enclosed side and one stair railing on each open side;

(v) On stairways 88 or more inches wide, one handrail on each enclosed side, one stair railing on each open side, and one intermediate stair railing located approximately midway of the width.

(b) Winding stairs shall be equipped with a handrail offset to prevent walking on all portions of the treads having width less than 6 inches.

(6) Standard specifications.

(a) A standard railing shall consist of top rail, intermediate rail, toe board, and posts, and shall have a vertical height of 36 inches to 42 inches from upper surface of top rail to floor, platform, runway, or ramp level. Each length of lumber shall be smooth-surfaced throughout the length of the railing. The intermediate rail shall be halfway between the top rail and the floor, platform, runway, or ramp. The ends of the rails shall not overhang the terminal posts except where such overhang does not constitute a projection hazard. Minimum requirements for standard railings under various types of construction are specified in the following items:

(i) For wood railings, the posts shall be of at least 2-inch by 4-inch stock spaced not to exceed 8 feet; the top rail shall be of at least 2-inch by 4-inch stock; the intermediate rail shall be of at least 1-inch by 6-inch stock.

(ii) For pipe railings, posts and top and intermediate railings shall be at least 1 1/2 inches nominal OD diameter with posts spaced not more than 8 feet on centers.

(iii) For structural steel railings, posts and top and intermediate rails shall be of 2-inch by 2-inch by 3/8-inch angles or other metal shapes of equivalent bending strength, with posts spaced not more than 8 feet on centers.

(iv) For wire rope railings, the top and intermediate railings shall be at least 1/2-inch fibre core rope, or the equivalent, with posts spaced not more than 8 feet on centers. The rope shall be stretched taut, so as to present a minimum deflection.

(v) The anchoring of posts and framing of members for railings of all types shall be of such construction that the completed structure shall be capable of withstanding a load of at least 200 pounds applied in any direction at any point on the top rail, with a minimum of deflection.

(vi) Railings receiving heavy stresses from employees trucking or handling materials shall be provided additional strength by the use of heavier stock, closer spacing of posts, bracing, or by other means.

(vii) Other types, sizes, and arrangements of railing construction are acceptable, provided they meet the following conditions:

(A) A smooth-surfaced top rail at a height above floor, platform, runway, or ramp level of between 36 inches and 42 inches;

(B) A strength to withstand at least the minimum requirement of 200 pounds top rail pressure with a minimum of deflection;

(C) Protection between top rail and floor, platform, runway, ramp, or stair treads, equivalent at least to that afforded by a standard intermediate rail;

(D) Elimination of overhang of rail ends unless such overhang does not constitute a hazard.

(b) A stair railing shall be of construction similar to a standard railing, but the vertical height shall be not more than 34 inches nor less than 30 inches from upper surface to top rail to surface of tread in line with face of riser at forward edge of tread.

(c)(i) A standard toe board shall be 4 inches minimum in vertical height from its top edge to the level of the floor, platform, runway, or ramp. It shall be securely fastened in place and have not more than 1/4-inch clearance above floor level. It may be made of any substantial material, either solid, or with openings not over 1 inch in greatest dimension.

(ii) Where material is piled to such height that a standard toe board does not provide protection, paneling, or screening from floor to intermediate rail or to top rail shall be provided.

(d)(i) A standard handrail shall be of construction similar to a standard railing except that it is mounted on a wall or partition, and does not include an intermediate rail. It shall have a smooth surface along the top and both sides of the handrail. The handrail shall have an adequate handhold for any one grasping it to avoid falling. Ends of the handrail shall be constructed so as not to constitute a projection hazard.

(ii) The height of handrails shall be not more than 34 inches nor less than 30 inches from upper surface of handrail to surface of tread, in line with face of riser or to surface of ramp.

(iii) All handrails and railings shall be provided with a clearance of approximately 3 inches between the handrail or railing and any other object.

(e) Floor opening covers shall be of any material that meets the following strength requirements:

(i) Conduits, trenches, and manhole covers and their supports, when located in roadways, and vehicular aisles shall be designed to carry a truck rear-axle load of at least 2 times the maximum intended load;

(ii) All floor opening covers shall be capable of supporting the maximum potential load but never less than two hundred pounds (with a safety factor of four).

(A) The cover shall be recessed to conform to the level of the surrounding floor or to be flush with the perimeter of the opening.

(B) The cover shall be secured by fastening devices to prevent unintentional removal.

(C) If it becomes necessary to remove the cover, a monitor shall remain at the opening until the cover is replaced. The monitor shall advise persons entering the area of the hazard, shall prevent exposure to the fall hazard and shall perform no other duties.

(f) Skylight openings that create a falling hazard shall be guarded with a standard railing, or covered in accordance with (e)(ii) of this subsection.



(g) Wall opening protection shall meet the following requirements:

(i) Barriers shall be of such construction and mounting that, when in place at the opening, the barrier is capable of withstanding a load of at least 200 pounds applied in any direction (except upward), with a minimum of deflection at any point on the top rail or corresponding member.

(ii) Screens shall be of such construction and mounting that they are capable of withstanding a load of at least 200 pounds applied horizontally at any point on the near side of the screen. They may be of solid construction, of grill work with openings not more than 8 inches long, or of slat work with openings not more than 4 inches wide with length unrestricted.

(7) Guarding of low-pitched roof perimeters during the performance of built-up roofing work.

(a) General provisions. During the performance of built-up roofing work on low-pitched roofs with a ground to eave height greater than 16 feet (4.9 meters), employees engaged in such work shall be protected from falling from all unprotected sides and edges of the roof as follows:

(i) By the use of a motion-stopping-safety system (MSS system); or

(ii) By the use of a warning line system erected and maintained as provided in subdivision (7)(c) of this section and supplemented for employees working between the warning line and the roof edge by the use of either an MSS system or, where mechanical equipment is not being used or stored, by the use of a safety monitoring system; or

(iii) By the use of a safety monitoring system on roofs 50 feet (15.25 meters) or less in width (see WAC 296-155-50501 Appendix—Roofs), where mechanical equipment is not being used or stored.

(b) Exception. The provisions of (7)(a) of this section do not apply at points of access such as stairways, ladders, and ramps, or when employees are on the roof only to inspect, investigate, or estimate roof level conditions. Roof edge materials handling areas and materials storage areas shall be guarded as provided in subdivision (7)(e) of this section.

(c) Warning lines.

(i) Warning lines shall be erected around all sides of the work area.

(A) When mechanical equipment is not being used, the warning line shall be erected not less than six feet (1.8 meters) from the roof edge;

(B) When mechanical equipment is being used, the warning line shall be erected not less than six feet (1.8 meters) from the roof edge which is parallel to the direction of mechanical equipment operation, and not less than 10 feet (3.1 meters) from the roof edge which is perpendicular to the direction of mechanical equipment operation.

(ii) The warning line shall consist of a rope, wire, or chain, and supporting stanchions erected as follows:

(A) The rope, wire, or chain shall be flagged at not more than six foot (1.8 meters) intervals with high-visibility material;

(B) The rope, wire, or chain shall be rigged and supported in such a way that its lowest point (including sag) is no less than 34 inches (.86 meters) from the roof surface and its highest point is no more than 39 inches (1 meter) from the roof surface;

(C) After being erected, with the rope, wire, or chain attached, stanchions shall be capable of resisting, without tipping over, a force of at least 16 pounds (71 Newtons) applied horizontally against the stanchion, 30 inches (0.76 meters) above the roof surface, perpendicular to the warning line, and in the direction of the roof edge;

(D) The rope, wire, or chain shall have a minimum tensile strength of 500 pounds (227 Kilograms), and after being attached to the stanchions, shall be capable of supporting, without breaking, the loads applied to the stanchions as prescribed in subitem (7)(c)(ii)(C) of this section; and

(E) The line shall be attached at each stanchion in such a way that pulling on one section of the line between stanchions will not result in slack being taken up in adjacent sections before the stanchion tips over.

(iii) Access paths shall be erected as follows:

(A) Points of access, materials handling areas and storage areas shall be connected to the work area by a clear access path formed by two warning lines.

(B) When the path to a point of access is not in use, a rope, wire, or chain, equal in strength and height to the warning line, shall be placed across the path at the point where the path intersects the warning line erected around the work area.

(d) Mechanical equipment. Mechanical equipment may be used or stored only in areas where employees are being protected by either a warning line or an MSS system. Mechanical equipment may not be used or stored between the warning line and the roof edge unless the employees are being protected by an MSS system. Mechanical equipment may not be used or stored where the only protection provided is by a safety monitoring system.

(e) Roof edge materials handling areas and materials storage. Employees working in a roof edge materials handling or materials storage area located on a low-pitched roof with a ground to eave height greater than 16 feet (4.9 meters) shall be protected from falling by the use of an MSS system along all unprotected roof sides and edges of the area.

(i) When guardrails are used at hoisting areas, a minimum of four feet of guardrail shall be erected on each side of the access point through which materials are hoisted.

(ii) A chain or gate shall be placed across the opening between the guardrail sections when hoisting operations are not taking place.

(iii) When guardrails are used at bitumen pipe outlets, a minimum of four feet of guardrail shall be erected on each side of the pipe.

(iv) When safety belt systems are used, they shall not be attached to the hoist.



(v) When safety belt systems are used, they shall be rigged to allow the movement of employees only as far as the roof edge.

(vi) Materials may not be stored within six feet of the roof edge unless guardrails are erected at the roof edge.

(vii) Materials which are piled, grouped, or stacked shall be stable and self-supporting.

(f) Training.

(i) The employer shall provide a training program for all employees engaged in built-up roofing work so that they are able to recognize and deal with the hazards of falling associated with working near a roof perimeter. The employees shall also be trained in the safety procedures to be followed in order to prevent such falls.

(ii) The employer shall assure that employees engaged in built-up roofing work have been trained and instructed in the following areas:

(A) The nature of fall hazards in the work area near a roof edge;

(B) The function, use, and operation of the MSS system, warning line, and safety monitoring systems to be used;

(C) The correct procedures for erecting, maintaining, and disassembling the systems to be used;

(D) The role of each employee in the safety monitoring system when this system is used;

(E) The limitations on the use of mechanical equipment; and

(F) The correct procedures for the handling and storage of equipment and materials.

(iii) Training shall be provided for each newly hired employee, and for all other employees as necessary, to assure that employees maintain proficiency in the areas listed in item (7)(f)(ii) of this section.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-505, filed 1/21/86. Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-13-053 (Order 81-9), § 296-155-505, filed 6/17/81; Order 76-29, § 296-155-505, filed 9/30/76; Order 74-26, § 296-155-505, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-50501 Appendix--Roofs.** This appendix serves as a guideline to assist employers in complying with the appropriate requirements of WAC 296-155-505 (7)(a). Each example shows a roof plan or plans and indicates where each roof or roof area is to be measured to determine its width. Section views or elevation views are shown where appropriate. Some examples show "correct" and "incorrect" subdivisions of irregularly shaped roofs into smaller regularly shaped areas. In all examples, the dimension selected to be the width of an area is the lesser of the two primary dimensions of the area. Example A shows that on a simple rectangular roof, width is the lesser of the two primary overall dimensions. This is also the case with roofs which are

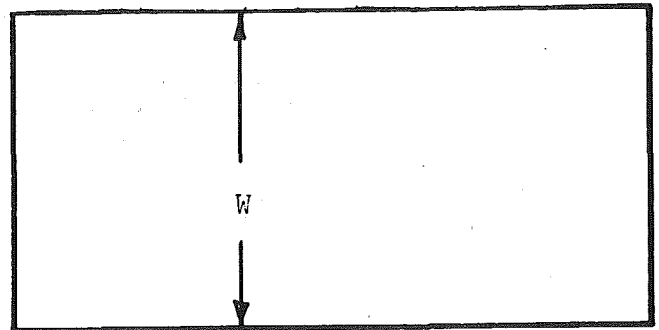
sloped toward or away from the roof center, as shown in Example B.

Many roofs are not simple rectangles. Such roofs may be broken down into subareas as shown in Example C. The process of dividing a roof area can produce many different configurations. Example C gives the general rule of using dividing lines of minimum length to minimize the size and number of the areas which are potentially less than 50 feet wide. The intent is to minimize the number of roof areas where WAC 296-155-505 (7)(a)(iii) can be applied.

Roofs which are comprised of several separate, non-continuous roof areas, as in Example D, may be considered as a series of individual roofs. Some roofs have penthouses, additional floors, courtyard openings, or similar architectural features; Example E shows how the rule for dividing roofs into subareas is applied to such configurations. Irregular, nonrectangular roofs must be considered on an individual basis, as shown in Example F.

Example A.

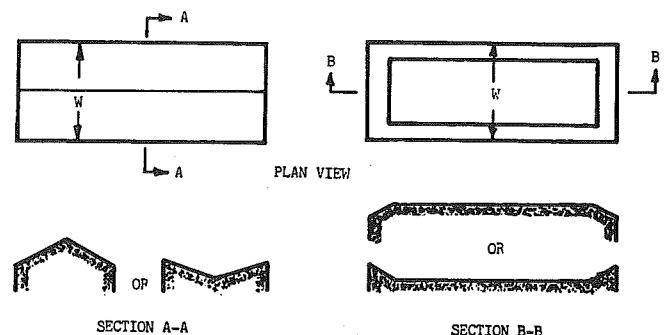
RECTANGULAR SHAPED ROOFS



PLAN VIEW

Example B.

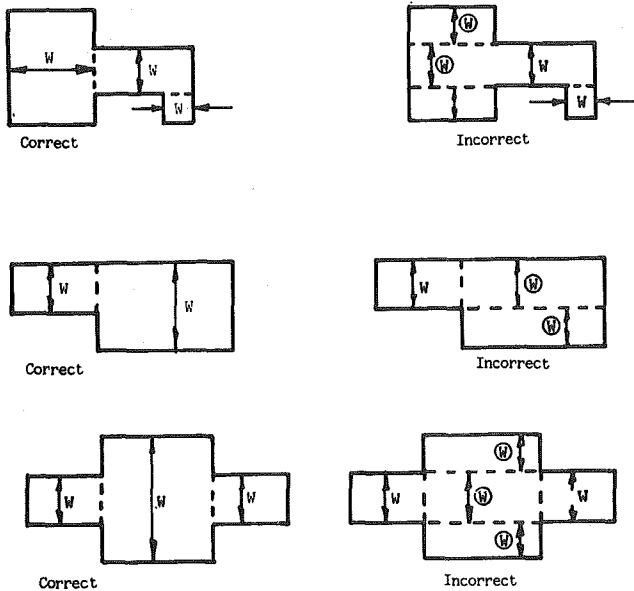
SLOPED RECTANGULAR SHAPED ROOFS



Example C.

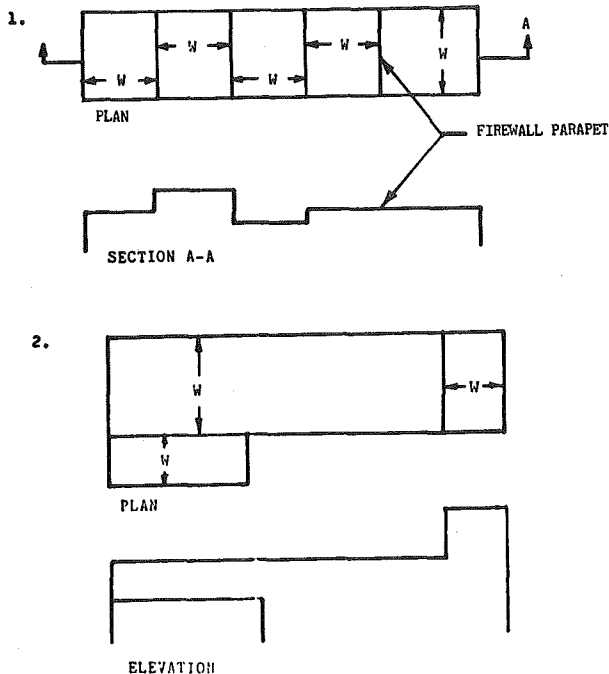
IRREGULARLY SHAPED ROOFS WITH RECTANGULAR SHAPED SECTIONS

Such roofs are to be divided into subareas by using dividing lines of minimum length to minimize the size and number of the areas which are potentially less than or equal to 50 feet (15.25 meters) in width, in order to limit the size of roof areas where WAC 296-155-505 (7)(a)(iii) can be applied. Dotted lines are used in the examples to show the location of dividing lines. X denotes incorrect measurements of width.



Example D.

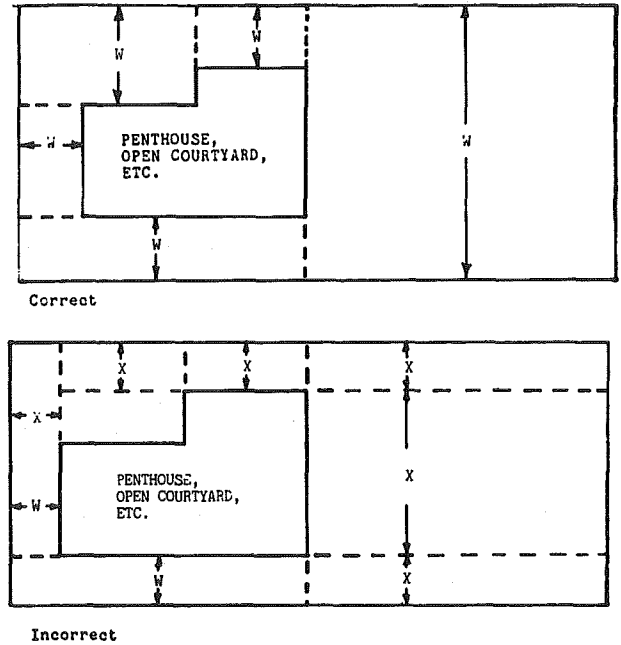
SEPARATE, NONCONTIGUOUS ROOF AREAS



Example E.

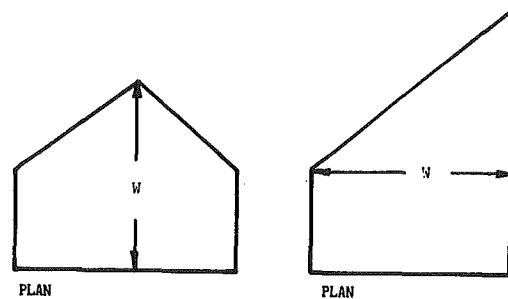
ROOFS WITH PENTHOUSES, OPEN COURT YARDS, ADDITIONAL FLOORS, ETC.

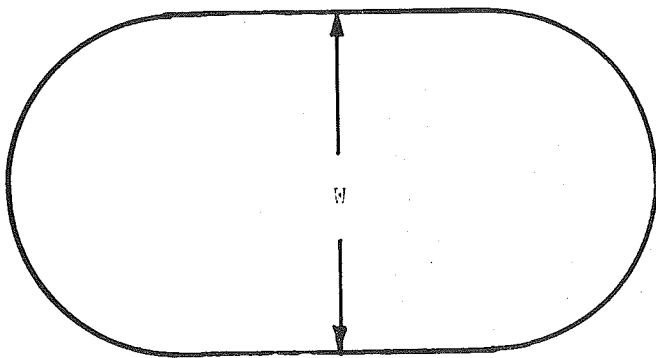
Such roofs are to be divided into subareas by using dividing lines of minimum length to minimize the size and number of the areas which are potentially less than or equal to 50 feet (15.25 meters) in width, in order to limit the size of roof areas where WAC 296-155-505 (7)(a)(iii) can be applied. Dotted lines are used in the examples to show the location of dividing lines. X denotes incorrect measurements of width.



Example F.

IRREGULAR, NONRECTANGULAR SHAPED ROOFS





PLAN

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-13-053 (Order 81-9), § 296-155-50501, filed 6/17/81.]

**WAC 296-155-50503 Roofing brackets.** (1) Roofing brackets shall be constructed to fit the pitch of the roof.

(2) Securing: Brackets shall be secured in place by nailing in addition to the pointed metal projections. When it is impractical to nail brackets, rope supports shall be used. When rope supports are used, they shall consist of first-grade manila of at least 3/4-inch diameter, or equivalent.

(3) Catch platform:

(a) A catch platform shall be installed below the working area of roofs more than sixteen feet from the ground to eaves with a slope greater than four inches in twelve inches without a parapet.

(b) In width, the platform shall extend two feet beyond the projection of the eaves and shall be provided with a guardrail, midrail, and toeboard.

(c) This provision shall not apply where employees engaged in work upon such roofs are protected by a safety belt attached to a lifeline.

(4) Crawling boards or chicken ladders.

(a) Crawling boards shall be not less than ten inches wide and one inch thick, having cleats 1 x 1 1/2 inches.

(i) The cleats shall be equal in length to the width of the board and spaced at equal intervals not to exceed twenty-four inches.

(ii) Nails shall be driven through and clinched on the underside.

(iii) The crawling board shall extend from the ridge pole to the eaves when used in connection with roof construction, repair, or maintenance.

(b) A firmly fastened lifeline of at least 3/4-inch diameter rope, or equivalent, shall be strung beside each crawling board for a handhold.

(c) Crawling boards shall be secured to the roof by means of adequate ridge hooks or other effective means.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-50503, filed 1/21/86.]

**WAC 296-155-50505 Roofing, insulating and waterproofing.** (1) Hoisting jack construction. Roofers hoisting jack shall be constructed to withstand the contemplated load to be hoisted. The beam from counter balance point to heel of jack shall be at least 3/4 the length of the entire beam.

(2) Counterweight. Hoisting jack shall be counterweighted with a minimum of three times the contemplated maximum load to be lifted. Counterweight shall be securely fastened to heel of jack to prevent displacement, or the jack shall be fastened by means of lashing, bolting, or other means to prevent displacement.

(3) Pulley attachment. A steel collar or U-bolt and shackle on head of the hoisting jack shall be provided for attachment of the pulley.

(4) Pulley construction. Hoisting pulleys shall be of steel construction.

(5) Hoisting line specifications. Where materials are hoisted by hand the hoist line shall be not less than five-eighths manila rope, or the equivalent. Where machine hoist is used the hoist line shall be wire rope.

(6) Hook construction. Hoisting hooks shall be of cast or forged steel heavy enough to prevent straightening under a load.

(7) Worker clearance. Workers shall not stand under the load.

(8) Hot buckets. Hot asphalt shall be kept at a safe level in buckets for carrying and hoisting.

(9) Ladders. Service buckets of hot asphalt shall not be carried up ladders by workers.

(10) Service bucket specifications. Service buckets shall be standard safety bucket or flatbottom bucket with bails fastened to an offset ear firmly riveted to side of bucket. There shall be a handle riveted near bottom of bucket for tipping purposes.

(11) Ladder extensions. Ladders shall extend at least three feet above the platform or roof served and shall be secured at top and bottom to prevent slipping.

(12) Safeguards for power lines. Safeguards shall be erected to prevent loads and lines contacting power lines where it is not possible to work at least 10 feet from the power lines.

(13) Asphalt cakes. Whole asphalt cakes shall be broken in chunks before being placed in hot tar pot. To eliminate the potential hazard of moisture being trapped in the cake and also prevent the splashing of hot material.

(14) Fire smothering. There shall be means to smother fires at fired tar pots.

(15) Mop handles. Mop or spud bar handles over three feet long shall be of wood or other nonconductive material.

(16) Protective clothing. Persons working at kettles or handling hot tar shall wear gloves and have arms fully protected by material capable of preventing burns.

(17) Tar pots. Open tar heating pots shall be kept outside of buildings.

(18) Tar pot procedures. Electric tar heating equipment may be used inside of the working enclosure provided that:

(a) Exhaust fans in connection with tubing capable of carrying fumes created by the heating process to the outside are installed and in constant use during heating operations.

(b) The equipment shall be provided with a hinged lid or baffle plate for the purpose of immediately smothering a pot fire.

(19) Ventilation. While hot tar is being applied inside an enclosure, exhaust fans to supplement natural ventilation shall be installed to expedite removal of gaseous fumes from the building.

(20) Prohibited locations. Flame heated tar pots shall be prohibited on roofs of structures.

(21) Tar pot controls. Tar pots shall be equipped with automatic controls or have an attendant at all times while in operation.

(22) Guarding roof perimeters. The perimeter of all roofs shall be guarded as defined by WAC 296-155-505.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-50505, filed 1/21/86.]

#### WAC 296-155-510 Stairways. (1) General.

(a) In all buildings or structures two or more stories or twenty-four feet or more in height or depth, suitable permanent or temporary stairways shall be installed.

##### EXCEPTIONS:

At those locations where unusual site conditions prevail, an alternate effective means of access acceptable to the division may be afforded.

(b) For the purpose of this section, scaffolds shall not be considered to be structures. Stairways shall be at least twenty-four inches in width and shall be equipped with handrails, treads and landings. Temporary stairs shall have a landing not less than thirty inches wide in the direction of travel at each floor, or level, but never less than one landing for every twelve feet of vertical rise.

##### EXCEPTIONS:

Stairways forty-four inches or less in width may have one handrail, except that stairways open on one or both sides shall have handrails provided on the open side or sides.

Prefabricated metal scaffold stairway systems.

(c) Stairways, ramps or ladders shall be provided at all points where a break in elevation of eighteen inches or more occurs in a frequently traveled passageway, entry or exit.

(d) A minimum of one stairway shall be provided for access and exit for buildings and structures to three stories or thirty-six feet; if more than three stories or thirty-six feet, two or more stairways shall be provided. Where two stairways are provided and work is being performed in the stairways, one shall be maintained clear for access between levels at all times.

##### NOTE:

For stairway access at demolition projects, refer to WAC 296-155-775 through 296-155-830.

##### EXCEPTIONS:

At those locations where unusual site conditions prevail, an alternate effective means of access acceptable to the division may be afforded.

For the purpose of this section, scaffolds shall not be considered to be structures.

(e) Stairways shall conform to the criteria shown in Figure K-1.

(f) Wood frame buildings.

(i) The stairway to a second or higher floor shall be completed before studs are raised to support the next higher floor.

(ii) Roof and attic work areas of all buildings shall be provided with a safe means of access and egress, such as stairways, ramps or ladders.

(iii) Cleats shall not be nailed to studs to provide access to and egress from roof or other work areas.

(g) Steel frame buildings. Stairways shall extend to the uppermost floor that has been planked or decked. Ladders may be used above that point.

(h) Reinforced concrete or composite steel—Concrete buildings. Stairways shall extend to the lowermost floor upon which a complete vertical shoring system is in place. A minimum of two ladders at different locations for each floor may be used above this floor but not to exceed three floors.

(2) Stairway railing and guardrails shall meet the requirements of WAC 296-155-505 (5) and (6).

(3) All parts of stairways shall be free of hazardous projections, such as protruding nails.

(4) Debris, and other loose materials, shall not be allowed on or under stairways.

(5) Slippery conditions on stairways shall be eliminated as soon as possible after they occur.

(6) Permanent steel or other metal stairways, and landings with hollow pan-type treads that are to be filled with concrete or other materials, when used during construction, shall be filled to the level of the nosing with solid material. The requirement shall not apply during the period of actual construction of the stairways themselves.

(7) Wooden treads for temporary service shall be full width.

(8) Metal landings shall be secured in place before filling.

(9) Temporary stairs shall have a landing not less than thirty inches in the direction of travel at every twelve feet of vertical rise.

(10) Stairs shall be installed at angles to the horizontal of between thirty degrees and fifty degrees. Because of space limitations, stairways sometimes have to be installed at angles above the fifty degree critical angle. Such installations are commonly called inclined ladders or ship's ladders. These shall have hand rails on both sides and open risers. They shall be capable of sustaining a live load of one hundred pounds per square foot with a safety factor of four. The following preferred and critical angles from the horizontal shall be considered for inclined ladders and ship's ladders:

(a) Thirty-five to sixty degrees – preferred angle from horizontal.

(b) Sixty to seventy degrees – critical angle from horizontal.

(11) Rise height and tread width shall be uniform throughout any flight of stairs including any foundation structure used as one or more treads of the stairs.

(12) All stairs shall be lighted in accordance with Part B of this chapter.

(13) Spiral stairways shall not be permitted except for special limited usage and secondary access situations where it is not practical to provide a conventional stairway.

(14) Employers are permitted to use alternating tread type stairs as long as they install, use, and maintain the stairs in accordance with manufacturers' recommendations and the following:

(a) The stair must be installed at an angle of seventy degrees or less.

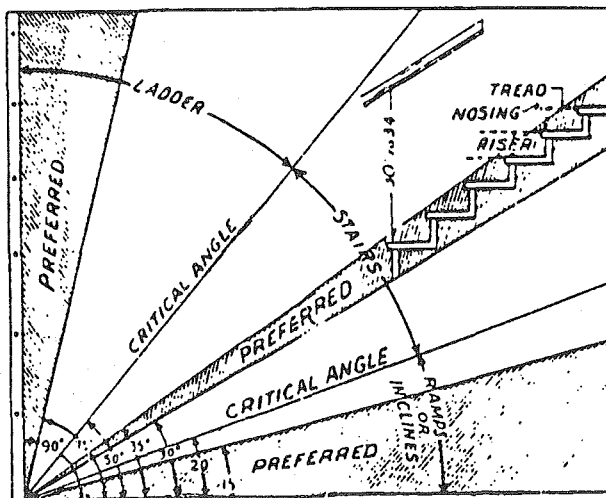
(b) The stair must be capable of withstanding a minimum uniform load of one hundred pounds per square foot with a design factor of 1.7, and the treads must be capable of carrying a minimum concentrated load of three hundred pounds at the center of any treadspan or exterior arc with a design factor of 1.7. If the stair is intended for greater loading, construction must allow for that loading.

(c) The stair must be equipped with a handrail on each side to assist the user in climbing or descending.

(15) Due to space limitations, when a permanent stairway must be installed at an angle above fifty degrees, such an installation (commonly called an inclined or ship's ladder) shall have treads, open risers and handrails on both sides.

(16) Where ladders are permitted for access under subsection (1) of this section, means shall be provided for employee hoisting of tools and material, such as a well wheel and hoisting line or the equivalent, so employees will have both hands free for ascending and descending ladders.

PREFERRED AND CRITICAL ANGLES OF FIXED LADDERS AND STAIRS



[Statutory Authority: Chapter 49.17 RCW, 89-11-035 (Order 89-03), § 296-155-510, filed 5/15/89, effective 6/30/89. Statutory Authority: RCW 49.17.040 and 49.17.050, 86-03-074 (Order 86-14), § 296-155-510, filed 1/21/86; Order 74-26, § 296-155-510, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-515 Ramps, runways, and inclined walkways.** (1) Width. Ramps, runways and inclined walkways shall be eighteen inches or more wide.

(2) Standard railings. Ramps, runways and inclined walkways shall be provided with standard railings when located four feet or more above ground or floor level.

[Title 296 WAC—p 2024]

(3) Ramp specifications. Ramps, runways and walkways shall not be inclined more than twenty degrees from horizontal and when inclined shall be cleated or otherwise treated to prevent a slipping hazard on the walking surface.

[Statutory Authority: RCW 49.17.040 and 49.17.050, 86-03-074 (Order 86-14), § 296-155-515, filed 1/21/86.]

Part L

CRANES, DERRICKS, HOISTS, ELEVATORS, AND CONVEYORS

WAC

296-155-525	Cranes and derricks.
296-155-530	Material hoists, personnel hoists, and elevators.
296-155-535	Base-mounted drum hoists.
296-155-540	Overhead hoists.
296-155-545	Conveyors.
296-155-550	Aerial cableways.
296-155-555	Gin poles.
296-155-560	Concrete bucket towers.
296-155-565	Hoisting engines.
296-155-570	Rigging—Wire rope.
296-155-575	Helicopters and helicopter cranes.
296-155-576	Figure L-1.
296-155-580	Aerial lifts.
296-155-59901	Table 1.
296-155-59902	Table 2.
296-155-59903	Table 3.
296-155-59904	Table 4.
296-155-59905	Table 5.
296-155-59906	Table 6.
296-155-59907	Table 7.
296-155-59908	Table 8.
296-155-59909	Table 9.
296-155-59910	Table 10.
296-155-59911	Table 11.
296-155-59912	Table 12.
296-155-59913	Table 13.
296-155-59914	Table 14.
296-155-59915	Table 15.
296-155-59916	Table 16.
296-155-59917	Table 17.
296-155-59918	Table 18.
296-155-59919	Table 19.
296-155-59920	Table 20.

**WAC 296-155-525 Cranes and derricks.** (1) General requirements.

(a) The employer shall comply with the manufacturer's specifications and limitations applicable to the operation of any and all cranes and derricks. Where manufacturer's specifications are not available the limitations assigned to the equipment shall be based on the determinations of a qualified engineer, competent in this field and such determinations will be appropriately documented and recorded. Attachments used with cranes shall not exceed the capacity, rating, or scope recommended by the manufacturer.

(b) Rated load capacities, and recommended operating speeds, special hazard warnings, or instruction, shall be conspicuously posted on all equipment. Instructions or warnings shall be visible to the operator while he is at his control station.

(c) Hand signals to crane and derrick operators shall be those prescribed by the applicable ANSI standard for

the type of crane in use. An illustration of the signals shall be posted at the job site.

Note: When decals, illustrating hand signals, are available from the division or otherwise, they should be posted at the operator's station.

(d) The employer shall designate a competent person who shall inspect all machinery and equipment prior to each use, and periodically during use to make sure it is in safe operating condition. Any deficiencies shall be repaired, or defective parts replaced, before continued use.

(e) A thorough, annual inspection of the hoisting machinery shall be made by a competent person, or by a government or private agency recognized by the department. The employer shall maintain a permanent record of the dates and results of all inspections for each hoisting machine and piece of equipment.

(f) Wire rope shall be taken out of service when any of the following conditions exist:

(i) In running ropes, six randomly distributed broken wires in one lay or three broken wires in one strand in one lay;

(ii) Wear of one-third the original diameter of outside individual wires. Kinking, crushing, bird caging, or any other damage resulting in distortion of the rope structure;

(iii) Evidence of any heat damage from any cause;

(iv) Reductions from nominal diameter of more than one-sixty-fourth inch for diameters up to and including five-sixteenths inch, one-thirty-second inch for diameters three-eighths inch to and including one-half inch, three-sixty-fourths inch for diameters nine-sixteenths inch to and including three-fourths inch, one-sixteenth inch for diameter seven-eighths inch to 1 1/8 inches inclusive, three-thirty-seconds inch for diameters 1 1/4 to 1 1/2 inches inclusive;

(v) In standing ropes, more than two broken wires in one lay in sections beyond end connections or more than one broken wire at an end connection.

(vi) Wire rope safety factors shall be in accordance with American National Standards Institute B 30.5-1968 or SAE J959-1966.

(g) The foot block of every derrick shall be securely supported and firmly secured against movement in any direction. Proper shores shall be placed against the foot blocks of the derrick to take the pull of the hoisting engine.

(h) Derricks shall be operated only by authorized personnel.

(i) The top of the mast on guy derricks shall be steadied by not less than six guy cables equally spaced.

(j) On guy derricks, eyes shall be formed in the guys at the masthead end by bending back the ends of the cables and clamping the ends with at least three clamps.

(k) A tag line or guide rope shall be used on all loads that swing freely. Guide ropes or tag lines shall be held by experienced persons.

(l) Care shall be taken to guard against injury to workers, or damage to scaffolds or buildings, from swinging loads.

(m) When "dead men" are used as anchors, the cable shall be so attached that the concentrated load will not cause a shear stress on the "dead men."

(n) On stiff leg derricks where the boom is longer than the mast, care shall be taken to see that the goose-necks are fitted to the stiff legs in a manner so that there will be no undue friction on the gudgeon pin.

(o) A collar shall be placed on the gudgeon pin above the goose-neck, and a hole drilled through the collar and the gudgeon pin, through which a steel bolt shall be passed to hold the collar in position; the steel bolt shall be of sufficient size to prevent the goose-neck from shearing it off when the loaded boom is swung against the stiff leg.

(p) Double sets of bolts shall be used to fasten back legs of a stiff leg derrick.

(q) Particular attention shall be given to the weighting and anchoring of stiff leg derricks.

(r) The operator shall avoid carrying loads over people.

(s) When work is stopped or when the derrick is not in operation, the boom shall be lowered to a horizontal position or tied in place to prevent it whipping with the wind or other external force.

(t) Only authorized personnel shall make sling hitches on loads.

(u) Workers shall not be allowed to ride on loads handled by derricks.

(v) Operators shall observe signals only from duly authorized persons. Under no circumstances shall a load be moved until the signal is received from authorized personnel.

(w) Bell, whistle, electric or visual signals shall be provided in connection with all hoists and cableways where an operator is stationed at the power device. Hoist signaling devices shall be so located as to minimize the possibility of signaling accidentally and located so that they cannot be operated by a person standing on hoist or bucket.

(x) Belts, gears, shafts, pulleys, sprockets, spindles, drums, fly wheels, chains, or other reciprocating, rotating, or other moving parts or equipment shall be guarded if such parts are exposed to contact by employees, or otherwise create a hazard. Guarding shall meet the requirements of the American National Standards Institute, B 15.1-1958 Rev., Safety Code for Mechanical Power Transmission Apparatus.

(y) A minimum distance of thirty inches clearance shall be maintained between the swing radius of the greatest extension of the crane superstructure or counterweights and a stationary object, including the crane itself, while the crane is in operation. When this clearance cannot be maintained, suitable barricades or safeguards shall be used to isolate the pinch point hazard area.

(z) All exhaust pipes shall be guarded or insulated where contact by employees, in the performance of normal duties, is possible.

(2) Additional requirements.

(a) Whenever internal combustion engine powered equipment exhausts in enclosed spaces, tests shall be

made and recorded to see that employees are not exposed to unsafe concentrations of toxic gases or oxygen deficient atmospheres. (See chapter 296-62 WAC, the general occupational health standards and other applicable standards.)

(b) All windows in cabs shall be of safety glass, or equivalent, that introduces no visible distortion that will interfere with the safe operation of the machine.

(c)(i) Where necessary for rigging or service requirements, a ladder or steps shall be provided to give access to a cab roof.

(ii) On cranes, guardrails, handholds and steps shall be provided for easy access to the car and cab conforming to American National Standards Institute, B30.5-1968.

(iii) Platforms and walkways shall have anti-skid surfaces.

(d) Fuel tank filler pipe shall be located in such a position, or protected in such manner, as to not allow spill or overflow to run onto the engine, exhaust, or electrical equipment of any machine being fueled.

(i) An accessible fire extinguisher of 5BC rating, or higher, shall be available at all operator stations or cabs of equipment.

(ii) All fuels shall be transported, stored, and handled to meet the rules of Part D of this chapter. When fuel is transported by vehicles on public highways, department of transportation rules concerning such vehicular transportation are considered applicable.

(e) Except where electrical distribution and transmission lines have been deenergized and visibly grounded at point of work or where insulating barriers, not a part of or an attachment to the equipment or machinery, have been erected to prevent physical contact with the lines, equipment or machines shall be operated proximate to power lines only in accordance with the following:

(i) For lines rated 50 kV. or below, minimum clearance between the lines and any part of the crane or load shall be 10 feet;

(ii) For lines rated over 50 kV., minimum clearance between the lines and any part of the crane or load shall be 10 feet plus 0.4 inch for each 1 kV. over 50 kV., or twice the length of the line insulator, but never less than 10 feet;

(iii) In transit with no load and boom lowered, the equipment clearance shall be a minimum of 4 feet for voltages less than 50 kV., and 10 feet for voltages over 50 kV. up to and including 345 kV., and 16 feet for voltages up to and including 750 kV;

(iv) A person shall be designated to observe clearance of the equipment and give timely warning for all operations where it is difficult for the operator to maintain the desired clearance by visual means;

(v) Cage-type boom guards, insulating links, or proximity warning devices may be used on cranes, but the use of such devices shall not alter the requirements of any other regulation of this part even if such device is required by law or regulation;

(vi) Any overhead wire shall be considered to be an energized line unless and until the person owning such

line or the electrical utility authorities indicate that it is not an energized line and it has been visibly grounded;

(vii) Prior to work near transmitter tower where an electrical charge can be induced in the equipment or materials being handled, the transmitter shall be deenergized or tests shall be made to determine if electrical charge is induced on the crane.

(f) The following precautions shall be taken when necessary to dissipate induced voltage:

(i) The equipment shall be provided with an electrical ground directly to the upper rotating structure supporting the boom; and

(ii) Ground jumper cables shall be attached to materials being handled by boom equipment when electrical charge is induced while working near energized transmitters. Crews shall be provided with nonconductive poles having large alligator clips or other similar protection to attach the ground cable to the load.

(iii) Combustible and flammable materials shall be removed from the immediate area prior to operations.

(g) No modifications or additions which affect the capacity or safe operation of the equipment shall be made by the employer without the manufacturer's or a qualified engineer's written approval. If such modifications or changes are made, the capacity, operation, and maintenance instruction plates, tags, or decals, shall be changed accordingly. In no case shall the original safety factor of the equipment be reduced.

(h) The employer shall comply with Power Crane and Shovel Association, Mobile Hydraulic Crane Standard No. 2.

(i) Sideboom cranes mounted on wheel or crawler tractors shall meet the requirements of SAE J743a-1964.

(3) Crawler, locomotive, and truck cranes.

(a) All jibs shall have positive stops to prevent their movement of more than 5° above the straight line of the jib and boom on conventional type crane booms. The use of cable type belly slings does not constitute compliance with this standard.

(b) All crawler, truck or locomotive cranes in use shall meet the applicable requirements for design, inspection, construction, testing, maintenance and operation as prescribed in the ANSI B30.5-1968, Safety Code for Crawler, Locomotive and Truck Cranes.

(4) Tower cranes.

(a) Tower cranes shall be erected under the immediate supervision of a competent person, designated by the employer.

(b) Tower cranes shall be erected, maintained and used in accordance with the manufacturer's specifications, recommendations and procedures. All modifications shall be approved by the manufacturer and engineered by a professional engineer. The safety factors shall not be reduced by any modifications. The crane plates and charts shall be changed to reflect any modifications made.

(c) A professional engineer shall certify that the crane foundations and underlying soil are adequate support for the tower crane with its maximum overturning movement.



(d) Tower cranes shall be positioned whereby they can swing 360° without either the counterweight or jib striking any building, structure or other object, except:

(i) If the crane can strike an object or another crane, suitable limit switches shall be installed which will prohibit contact with such objects, or;

(ii) Direct voice communications shall be established between any operator of the tower crane(s) involved and a signalman so stationed where he can observe the boom and/or counterweight movement, and the object with which it may contact to warn the operator(s) of imminent danger.

(iii) A secondary means of positive communications shall be established as a back-up for possible direct voice communication failure.

Note: Radio communication systems without tone coded squelch are prohibited. Citizens band radios shall not be used as a means of communications for tower cranes.

(e) Prior to installing a climbing tower crane within an existing building or new construction, a structural engineer shall certify that the building is designed to withstand the torque and floor loading created by the crane to be installed.

(f) Prior to initial use, all newly erected or altered cranes shall be tested with the design rated load to insure compliance with this standard, including the following functions:

- (i) Hoisting and lowering;
- (ii) Trolley travel;
- (iii) Swing motion;
- (iv) Limit, locking and safety devices;
- (v) Crane travel where applicable; and
- (vi) Foundation and erection.

Note: Tower cranes erected on a new foundation shall be tested in accordance with ANSI B30.3-1975 Chapter 3-1.

(A) The test shall consist of suspending a load of not less than 100% of the rated capacity for five minutes. The load shall be suspended from the furthest point of the length of boom (jib) to be used. The results of this test shall be within the manufacturer's recommendations and/or specifications.

(B) A record of each test shall be made and signed by the person responsible for conducting the test. Such records shall be maintained on the construction site for the duration of the construction work for which it was erected and subsequently made a part of the firm's permanent equipment records. Records shall be made available to authorized representatives of the department, upon request.

(g) A capacity chart shall be furnished by each crane manufacturer which shall include a full and complete range of crane load ratings at all stated operating radii for each allowable speed and each recommended counterweight load.

(i) Such chart shall be posted in the operator's cab or at the remote control stand he may be using. In lieu of the chart at the remote control stand, a minimum of two weight capacity signs shall be affixed to the jib or boom. The chart shall be visible and readable to the operator while he is in his normal operating position.

(h) Operating controls shall be properly marked to indicate the function of the controls in each position.

(i) An operating and maintenance manual shall be provided with each tower crane.

(j) Limit switches shall be installed and shall be kept properly adjusted. They shall be protected or isolated in a manner which will prevent unauthorized tampering. Limit switches shall provide the following functions:

(i) Safely limit the travel of the trolley to prevent it from hitting the outer end of the jib.

(ii) Limit the upward travel of the load block to prevent two-blocking.

(iii) Limit the load being lifted in a manner whereby no more than 110% of the maximum rated load can be lifted or moved.

(k) The crane shall not be used to pull vehicles of any type, remove piling, loosen form work, pull away loads which are attached to the ground or walls, or for any operation other than the proper handling of freely suspended loads.

(l) When the operator may be exposed to the hazard of falling objects, the tower crane cab and/or remote control station shall have adequate overhead protection.

(m) The operator shall be protected from the weather. If enclosed cabs are provided they shall provide clear visibility in all directions and glass shall be approved safety glass or the equivalent.

(n) Operators shall not occupy cabs of remotely-controlled stations during repositioning operations.

(o) An approved and safe means shall be provided for access to operator's cab and machinery platform.

(p) When necessary for inspection or maintenance purposes, ladders, walkways with railing or other devices shall be provided.

(q) Each tower crane shall be provided with a slewing brake capable of preventing the jib or boom from rotating in either direction and stopping the rotation of the jib or boom while loaded, when desired. Such brake shall have a holding device which, when set, will hold the jib or boom in a fixed location without additional attention of the operator. When the crane is out of operation, the jib or boom shall be pointed downwind and the slewing brake shall be released so as to permit the jib or boom to weathervane, providing the jib or boom has a clear 360 degree rotation. Where a 360 degree rotation is not provided, the jib or boom shall be pointed downwind from the prevailing wind and the slewing brake set.

(r) Each tower crane shall be provided with a braking system on the trolley capable of stopping and holding the trolley in any desired position while carrying a maximum load. This brake shall be capable of being locked in a fixed location without additional attention of the operator. An automatic brake or device shall be installed which will immediately stop and lock the trolley in position in the event of a breakage of the trolley rope.

(s) All electrical equipment shall be properly grounded and protection shall be provided against lightning.

(t) When the operator is actually operating the crane, he shall remain in a stationary position.

(u) All crane brakes shall automatically set in event of power failure. Swing brakes shall also function in this manner or be capable of being set manually.

(v) Climbing jack systems used for raising a tower crane shall be equipped with over-pressure relief valves, direct-reading pressure gauges, and pilot-operated hydraulic check valves installed in a manner which will prevent jack from retracting should a hydraulic line or fitting rupture or fail.

(w) During periods of high winds or weather affecting visibility, i.e., fog, etc., only loads shall be handled that are consistent with good safety practices. Good safety practices shall be mutually agreed upon by the operator and the person in charge of the construction job, with due consideration given to manufacturer's specifications and recommendations.

(x) Counterweights shall be securely fastened in place and shall not exceed the weight as recommended by the manufacturer for the length of jib being used. However, an amount of counterweight as recommended by the manufacturer shall be used.

(y) Tower cranes shall be inspected and maintained in accordance with the manufacturer's recommendations or more frequently if there is reason to suspect a possible defect or weakening of any portion of the structure or equipment.

(z) Guy wires, wedges, braces or other supports shall be inspected at the beginning and at midpoint of each working shift to ascertain that they are functioning as intended.

(5) Additional tower crane requirements.

(a) An approved method shall be instituted for transmitting signals to the operator. Standard hand signals for crane operations shall be used, whenever possible; however, if conditions are such that hand signals are ineffective, radio-controlled or electric-whistle signal or two-way voice communication shall be used. (See NOTE under WAC 296-155-525 (4)(d).)

(b) Tower cranes shall not be erected or raised when the wind velocity at the worksite exceeds 20 m.p.h. or that specified by the manufacturer.

(c) Tower crane operators shall be trained and experienced in tower crane operations; however, for gaining experience, persons may operate the tower crane if under the immediate supervision of an experienced operator.

(d) Adequate clearance shall be maintained between moving and rotating structures of the crane and fixed objects to allow the passage of employees without harm.

(e) Employees required to perform duties on the horizontal boom of hammerhead tower cranes shall be protected against falling by guardrails or by safety belts and lanyards attached to crane or to lifelines in conformance with Part C of this chapter.

(f) Buffers shall be provided at both ends of travel of the trolley.

(g) Cranes mounted on rail tracks shall be equipped with limit switches limiting the travel of the crane on the track and stops or buffers at each end of the tracks.

(h) All hammerhead tower cranes in use shall meet the applicable requirements for design, construction, installation, testing, maintenance, inspection, and operation as prescribed by the manufacturer.

(i) Access ladders inside the telescoping sections of tower cranes are exempt from those sections of the safety standards pertaining to cleat length and cleat spacing, but shall conform to manufacturer's recommendations and specifications.

(6) Overhead and gantry cranes.

(a) The rated load of the crane shall be plainly marked on each side of the crane, and if the crane has more than one hoisting unit, each hoist shall have its rated load marked on it or its load block, and this marking shall be clearly legible from the ground or floor.

(b) Bridge trucks shall be equipped with sweeps which extend below the top of the rail and project in front of the truck wheels.

(c) Except for floor-operated cranes, a gong or other effective audible warning signal shall be provided for each crane equipped with a power traveling mechanism.

(d) All overhead and gantry cranes in use shall meet the applicable requirements for design, construction, installation, testing, maintenance, inspection, and operation as prescribed in ANSI B30.2.0-1967, Safety Code for Overhead and Gantry Cranes.

(7) Derricks. All derricks in use shall meet the applicable requirements for design, construction, installation, inspection, testing, maintenance, and operation as prescribed in American National Standard Institute B30.6-1969, Safety Code for Derricks.

(8) Floating cranes and derricks.

(a) Mobile cranes mounted on barges.

(i) When a mobile crane is mounted on a barge, the rated load of the crane shall not exceed the original capacity specified by the manufacturer.

(ii) A load rating chart, with clearly legible letters and figures, shall be provided with each crane, and securely fixed at a location easily visible to the operator.

(iii) When load ratings are reduced to stay within the limits for list of the barge with a crane mounted on it, a new load rating chart shall be provided.

(iv) Mobile cranes on barges shall be positively secured.

(b) Permanently mounted floating cranes and derricks.

(i) When cranes and derricks are permanently installed on a barge, the capacity and limitations of use shall be based on competent design criteria.

(ii) A load rating chart with clearly legible letters and figures shall be provided and securely fixed at a location easily visible to the operator.

(iii) Floating cranes and floating derricks in use shall meet the applicable requirements for design, construction, installation, testing, maintenance, and operation as prescribed by the manufacturer.

(c) Protection of employees working on barges. The employer shall comply with the applicable requirements for protection of employees as specified in WAC 296-155-630.

(9) Mobile cranes and excavation machines.

(a) In all power driven shovel operations the person in charge shall issue instructions necessary to prevent accidents, to detect and correct unsafe acts and dangerous conditions, and to enforce all safety rules and regulations.

He shall also issue instructions on the proper method of using tools and handling material.

(b) Where the ground is soft or uneven, timbering and planking shall be used to provide firm foundation and distribute the load.

(c) In case of a breakdown, the shovel shall be moved away from the foot of the slope before repairs are made.

(d) All persons shall keep away from the range of the shovel's swing and shall not be permitted to stand back of the shovel or in line with the swing of the dipper during operation or moving of shovel.

(e) Unauthorized persons shall not be allowed on the shovel during operations, and the operator shall not converse with other persons while operating machine.

(f) The shovel dipper shall rest on the ground or on blocking during shut down periods.

(g) Shovels shall be inspected daily and all defects promptly repaired.

(h) All rubber tired mobile cranes shall be equipped with outriggers and sufficient blocking to properly stabilize crane while operating.

(i) Rubber tired mobile cranes shall be equipped with rear view mirrors.

(j) Positive boom stops shall be provided on all mobile cranes of the wheel and crawler type.

(k) Length of a crane boom and amount of counterweight shall not exceed manufacturer's rated capacity for equipment involved; except on isolated cases where permission is granted by the department.

(l) On all cranes where wedge brackets are used as terminal connections, the proper size wedge shall be used.

(m) On all mobile cranes, the hoist and boom drums shall be provided with a positive operated pawl or dog which shall be used in addition to the brake to hold the load and boom when they are suspended. Counterweight operated dogs are prohibited.

(n) Oiling and greasing shall be done under safe conditions with machine at rest, except when motion of machine is necessary.

(o) All steps, running boards, and boom ladder shall be of substantial construction and in good repair at all times.

(p) Operators shall not leave the cab while master clutch is engaged.

(q) Fire extinguishers shall be readily accessible and within reach of operator at all times.

(r) All shovel and crane cabs shall be kept clean and free of excess oil and grease on floor and machinery. Oily and greasy rags shall be disposed of immediately after use and not allowed to accumulate.

(s) Tools shall not be left on the cab floor. Spare cans of oil or fuel, and spare parts, shall not be stored in cabs, except in approved racks provided for that purpose.

(t) Mats or planking shall be used in moving shovels or cranes over soft or uneven ground.

(u) Cranes or shovels setting on steep grades shall be securely blocked or secured with a tail hold.

(v) Smoking shall be prohibited while fueling or oiling machines.

(w) Gasoline powered motors shall be stopped during refueling.

(x) Handling of movable feed line (bologna) shall be accomplished with insulated hooks and lineman's rubber gloves.

(y) Where cables cross roads they shall be elevated or placed in a trench.

(z) On all power shovels, including back-hoe types, of one-half cubic yard capacity or over, and on all dragline cranes or all-purpose cranes of the crawler or wheel type, two persons shall constitute the minimum working crew.

[Order 76-29, § 296-155-525, filed 9/30/76; Order 74-26, § 296-155-525, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-530 Material hoists, personnel hoists, and elevators. (1) General requirements.**

(a) The employer shall comply with the manufacturer's specifications and limitations applicable to the operation of all hoists and elevators. Where the manufacturer's specifications are not available, the limitations assigned to the equipment shall be based on the determinations of a professional engineer competent in the field.

(b) Rated load capacities, recommended operating speeds, and special hazard warning or instructions shall be posted on cars and platforms.

(c) Wire rope shall be removed from service when any of the following conditions exists:

(i) In hoisting ropes, six randomly distributed broken wires in one rope lay or three broken wires in one strand in one rope lay;

(ii) Abrasion, scrubbing, flattening, or peening, causing loss of more than one-third of the original diameter of the outside wires;

(iii) Evidence of any heat damage resulting from a torch or any damage caused by contact with electrical wires;

(iv) Reduction from nominal diameter of more than three sixty-fourths inch for diameters up to and including three-fourths inch; one-sixteenth inch for diameters seven-eighths to 1 1/8 inches; and three thirty-seconds inch for diameters 1 1/4 to 1 1/2 inches.

(d) Hoisting ropes shall be installed in accordance with the wire rope manufacturer's recommendations.

(e) The installation of live booms on hoists is prohibited.

(f) The use of endless belt-type man lifts on construction shall be prohibited.

(g) Employees shall not be permitted to ride on top of material hoists, personnel hoists or permanent elevators except for purposes of inspection, maintenance, elevator installation or dismantling work.

(2) Material hoists, (a)(i) Operating rules shall be established and posted at the operator's station of the hoist. Such rules shall include signal system and allowable line speed for various loads. Rules and notices shall

be posted on the car frame or crosshead in a conspicuous location, including the statement "No riders allowed."

(ii) No person shall be allowed to ride on material hoists except for the purposes of inspection and maintenance.

(b) All entrances of the hoistways shall be protected by substantial gates or bars which shall guard the full width of the landing entrance. All hoistway entrance bars and gates shall be painted with diagonal contrasting colors, such as black and yellow stripes.

(i) Bars shall be not less than 2- by 4-inch wooden bars or the equivalent, located 2 feet from the hoistway line. Bars shall be located not less than 36 inches nor more than 42 inches above the floor.

(ii) Gates or bars protecting the entrances to hoistway shall be equipped with a latching device.

(c) Overhead protective covering of two-inch planking, 3/4-inch plywood or other solid material of equivalent strength shall be provided on the top of every material hoist cage or platform to prevent objects falling on the workers loading or unloading the hoist.

(i) The protective covering on the top of the cage or platform may be made in hinged sections that may be raised when hoisting long material.

(ii) When using a cage or platform for long material, the several pieces of the material shall be securely fastened together and made fast to the cage or platform, so that no part of the load can fall or project beyond the sides of the cage or platform.

(d) The operator's station of a hoisting machine shall be provided with overhead protection equivalent to tight planking not less than 2 inches thick. The support for the overhead protection shall be of equal strength.

(e) Hoist towers may be used with or without an enclosure on all sides. However, whichever alternative is chosen, the following applicable conditions shall be met:

(i) When a hoist tower is enclosed, it shall be enclosed on all sides for its entire height with a screen enclosure of 1/2-inch mesh, No. 18 U.S. gauge wire or equivalent, except for landing access.

(ii) When a hoist tower is not enclosed, the hoist platform or car shall be totally enclosed (caged) on all sides for the full height between the floor and the overhead protective covering with 1/2-inch mesh of No. 14 U.S. gauge wire or equivalent. The hoist platform enclosure shall include the required gates for loading and unloading. A 6-foot high enclosure shall be provided on the unused sides of the hoist tower at ground level.

(f) Car arresting devices shall be installed to function in case of rope failure.

(g) All material hoist towers shall be designed by a licensed professional engineer.

(h) All material hoists shall conform to the requirements of ANSI A10.5-1969, Safety Requirements for Material Hoists.

### (3) Personnel hoists.

(a) Personnel hoists shall be provided for access and egress on all multi story buildings where vertical travel exceeds sixty feet from a ground level access point.

(b) Hoist towers outside the structure shall be enclosed for the full height on the side or sides used for

entrance and exit to the structure. At the lowest landing, the enclosure on the sides not used for exit or entrance to the structure shall be enclosed to a height of at least 10 feet. Other sides of the tower adjacent to floors or scaffold platforms shall be enclosed to a height of 10 feet above the level of such floors or scaffolds.

(c) Towers inside of structures shall be enclosed on all four sides throughout the full height.

(d) Towers shall be anchored to the structure at intervals not exceeding 25 feet. In addition to tie-ins, a series of guys shall be installed. Where tie-ins are not practical the tower shall be anchored by means of guys made of wire rope at least one-half inch in diameter, securely fastened to anchorages to ensure stability.

(e) Hoistway doors or gates shall be not less than 6 feet 6 inches high and shall be provided with mechanical locks which cannot be operated from the landing side, and shall be accessible only to persons on the car.

(f) Cars shall be permanently enclosed on all sides and the top, except sides used for entrance and exit, which have car gates or doors.

(g) A door or gate shall be provided at each entrance to the car which shall protect the full width and height of the car entrance opening.

(h) Overhead protective covering of 2-inch planking, 3/4-inch plywood or other solid material of equivalent strength shall be provided on the top of every personnel hoist.

(i) Doors or gates shall be provided with electric contacts which do not allow movement of the hoist when door or gate is open.

(j) A signal device shall be installed in the elevator car and only operated by an attendant who shall give the signals for operation, when transporting workers.

(k) An electrical push button signalling device or other approved signalling system shall be provided at each floor landing connected to an annunciator in the car. The signal code shall be posted adjacent to the signal device at each and every work level and at operator's work level. All wording shall be black on a white card, in large clear letters.

(l) The elevator machine and controls shall be housed in as a protection against accidents and the weather, and the door kept locked against unauthorized entrance when operator is not in attendance.

(m) Safeties shall be capable of stopping and holding the car and rated load when traveling at governor tripping speed.

(n) Cars shall be provided with a capacity and data plate secured in a conspicuous place on the car or crosshead.

(o) Internal combustion engines shall not be permitted for direct drive.

(p) Normal and final terminal stopping devices shall be provided.

(q) An emergency stop switch shall be provided in the car and marked "stop."

(r) Ropes:

(i) The minimum number of hoisting ropes used shall be three for traction hoists and two for drum-type hoists.

- (ii) The minimum diameter of hoisting and counter-weight wire ropes shall be 1/2-inch.
- (iii) Safety factors:

MINIMUM FACTORS OF SAFETY  
FOR SUSPENSION WIRE ROPES

Rope speed in feet per minute:	Minimum factor of safety
50 .....	7.60
75 .....	7.75
100 .....	7.95
125 .....	8.10
150 .....	8.25
175 .....	8.40
200 .....	8.60
225 .....	8.75
250 .....	8.90
300 .....	9.20
350 .....	9.50
400 .....	9.75
450 .....	10.00
500 .....	10.25
550 .....	10.45
600 .....	10.70

(s) Following assembly and erection of hoists, and before being put in service, an inspection and test of all functions and safety devices shall be made under the supervision of a competent person. A similar inspection and test is required following major alteration of an existing installation. All hoists shall be inspected and tested at not more than 3-month intervals. Records shall be maintained and kept on file for the duration of the job.

(t) All personnel hoists used by employees shall be constructed of materials and components which meet the specifications for materials, construction, safety devices, assembly, and structural integrity as stated in the American National Standard A10.4-1963, Safety Requirements for Workmen's Hoists. The requirements of this subdivision do not apply to cantilever type personnel hoists.

(u) Wire rope shall be taken out of service when any of the following conditions exist:

- (i) In running ropes, six randomly distributed broken wires in one lay or three broken wires in one strand in one lay;
- (ii) Wear of one-third the original diameter of outside individual wires. Kinking, crushing, bird caging, or any other damage resulting in distortion of the rope structure;
- (iii) Evidence of any heat damage from any cause;
- (iv) Reductions from nominal diameter of more than three-sixty-fourths inch for diameters to and including three-fourths inch, one sixteenth inch for diameter seven-eighths inch to 1 1/8 inches inclusive, three-thirty-seconds inch for diameters 1 1/4 to 1 1/2 inches inclusive;

(v) In standing ropes, more than two broken wires in one lay in sections beyond end connections or more than one broken wire at an end connection.

(v)(i) Personnel hoists used in bridge tower construction shall be approved by a registered professional engineer and erected under the supervision of a qualified engineer competent in this field.

(ii) When a hoist tower is not enclosed, the hoist platform or car shall be totally enclosed (caged) on all sides for the full height between the floor and the overhead protective covering with 3/4-inch mesh of No. 14 U.S. gauge wire or equivalent. The hoist platform enclosure shall include the required gates for loading and unloading.

(iii) These hoists shall be inspected and maintained on a weekly basis. Whenever the hoisting equipment is exposed to winds exceeding 35 miles per hour it shall be inspected and put in operable condition before reuse.

(4) Permanent elevators under the care and custody of the employer and used by employees for work covered by this act shall comply with the requirements of American National Standards Institute, A17.1-1971, and inspected in accordance with A17.2-1960 with addenda A17.2a-1965, A17.2b-1967.

Note: For additional information refer to chapter 296-90 WAC, safety requirements for cantilever hoists and chapter 296-100 WAC, safety requirements for material hoists.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-530, filed 1/21/86; Order 74-26, § 296-155-530, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-535 Base-mounted drum hoists. (1) General requirements.**

(a) Exposed moving parts such as gears, projecting screws, setscrews, chain, cables, chain sprockets, and reciprocating or rotating parts, which constitute a hazard, shall be guarded.

(b) All controls used during the normal operation cycle shall be located within easy reach of the operator's station.

(c) Electric motor operated hoists shall be provided with:

- (i) A device to disconnect all motors from the line upon power failure and not permit any motor to be restarted until the controller handle is brought to the "off" position;
- (ii) Where applicable, an overspeed preventive device;
- (iii) A means whereby remotely operated hoists stop when any control is ineffective.

(d) All base-mounted drum hoists in use shall meet the applicable requirements for design, construction, installation, testing, inspection, maintenance, and operation, as prescribed by the manufacturer.

(2) Specific requirements. (Reserved.)

[Order 74-26, § 296-155-535, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-540 Overhead hoists. (1) General requirements.**

(a) The safe working load of the overhead hoist, as determined by the manufacturer, shall be indicated on

the hoist, and this safe working load shall not be exceeded.

(b) The supporting structure to which the hoist is attached shall have a safe working load equal to that of the hoist.

(c) The support shall be arranged so as to provide for free movement of the hoist and shall not restrict the hoist from lining itself up with the load.

(d) The hoist shall be installed only in locations that will permit the operator to stand clear of the load at all times.

(e) Air hoists shall be connected to an air supply of sufficient capacity and pressure to safely operate the hoist. All air hoses supplying air shall be positively connected to prevent their becoming disconnected during use.

(f) All overhead hoists in use shall meet the applicable requirements for construction, design, installation, testing, inspection, maintenance, and operation, as prescribed by the manufacturer.

(2) Specific requirements. (Reserved.)

[Order 74-26, § 296-155-540, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-545 Conveyors.** (1) All conveyors in use shall meet the applicable requirements for design, construction, inspection, testing, maintenance, and operation, as prescribed in ANSI B20.1-1976, Safety Code for Conveyors, Cableways, and Related Equipment.

(2) Starting precautions.

(a) When the entire length of a conveyor is visible from the starting switch, the operator shall visually check to make certain that all persons are in the clear before starting the conveyor.

(b) When the entire length of the conveyor is not visible from the starting switch, a positive audible or visible warning system shall be installed and operated to warn persons that the conveyor will be started.

(c) All reasonable precautions shall be taken by the operator prior to starting a conveyor, to assure that no person is in a hazardous location where he may be injured when the conveyor is started.

(3) Riding and walking on conveyors.

(a) Riding on conveyor chains, belt, or bucket elevators shall be prohibited.

(b) Persons shall not be allowed to walk on conveyors except for emergency purposes and then only after the conveyor has been de-energized and the person can do so safely.

(c) Riding of conveyors shall only be permitted on the manlift steps and platforms with handholds attached and other safety factors as specified in chapter 296-82 WAC, Safety standards for existing belt manlifts.

(4) Stop controls.

(a) Means for stopping the motor or engine of a conveyor shall be provided at the operator's station.

(b) If the operator's station is at a remote point, similar provisions for stopping the motor or engine shall be provided at the motor or engine location.

(5) Emergency controls. Emergency stop switches shall be arranged so that the conveyor cannot be started

again until the actuating stop switch has been reset to running or "on" position.

(6) Screw type conveyors. Screw or auger type conveyors shall be guarded to prevent employee contact with turning flights.

(7) Overhead conveyors.

(a) Where a conveyor passes over work areas, aisles, or thoroughfares, guards shall be provided to protect persons required to work below the conveyors.

(b) Where a conveyor crosses over an aisle or passageway, it shall be conspicuously marked by suitable signs, as required by Part E of this chapter.

(c) When the return strand of a conveyor operates within seven feet of the floor there shall be a trough provided of sufficient strength to carry the weight resulting from a broken chain. If the strands are over a passageway, a means shall be provided to catch and support the ends of the chain in the event of a break.

(8) Emergency stop.

(a) Conveyors shall be provided with an emergency stopping device (panic-type) which can be reached from the conveyor.

(b) The emergency stopping device shall be located near the material entrance and shall stop the conveyor a sufficient distance away from the hazard to prevent injury.

(c) Where the conveyor leading into such equipment is under constant control of an operator who has full view of the material entrance who is located or restrained where he cannot possibly fall onto the conveyor an emergency stopping device is not mandatory.

(9) Conveyor lockout.

(a) Conveyors shall be locked out with a padlock at any time repair, maintenance, or clean-up work is being performed on the conveyor.

(b) Tags or push-button stops are not acceptable.

(10) Where conveyors are in excess of seven feet in height, means shall be provided to safely permit essential inspection and maintenance operations.

(11) Conveyor repair.

(a) Any part showing signs of significant wear shall be inspected carefully and replaced prior to reaching a condition where it may create a hazard.

(b) Replacement parts shall be equal to or exceed the manufacturer's specifications.

[Statutory Authority: RCW 49.17.040 and 49.17.050, 86-03-074 (Order 86-14), § 296-155-545, filed 1/21/86; Order 74-26, § 296-155-545, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-550 Aerial cableways.** (1) Cableways shall be designed to withstand the maximum required load with a safety factor of five (5) on all its parts.

(2) Safety stay lines shall be installed at anchor ends and equal in strength to the cableway.

(3) Where towers are required they shall be securely guyed or constructed to carry the maximum sustained load.

(4) Towers shall be provided with ladderways to facilitate safe access for repairs and inspections.



(5) Towers shall have sufficient elevation to provide substantial clearance for cableway and loads carried over all contemplated work.

(6) Running lines and sheaves, where accessible, shall be guarded.

(7) The carrier, carrier sheaves, bearings, bucket latch and all working parts shall be lubricated and visually inspected daily.

(8) All the wire ropes shall be kept lubricated with proper lubricant.

(9) Daily visual inspection shall be made of the button line, especially at the buttons where abrasion is caused by the carrier rebound. Rubber and steel ferrule shock absorbers shall be placed at each end of buttons.

(10) All loading, unloading and working stations shall be adequately lighted for night operation. Clearance lights shall be installed on all high points under cableway.

[Order 74-26, § 296-155-550, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-555 Gin poles.** (1) Gin poles shall be properly guyed according to the type used.

(2) Anchors may be of "dead men" or attached to some permanent stable structure.

(3) When the guy lines are anchored to a permanent structure, the anchors shall be distant at least one-half the height of the pole from its base, and when "dead men" are used, they shall be located a distant from the base at least one and one-half times the height of the pole.

(4) The pole shall be securely fastened at the foot to prevent kicking out during operation.

(5) Gin poles shall be of selected timber, sound and free from knots or other injurious defects.

(6) Allowable loads for spruce timbers used as gin poles. The allowable loads and the limiting lengths given are based on the U.S. Forest Products Laboratory Standard Recommendations for Spruce of Common Grade, based on pin connected ends for columns.

Actual	Length in feet	Allowable load capacity in tons
6" x 6"	10	10.4
6" x 6"	15	6.6
6" x 6"	20	3.7
6" x 6"	25 Max.	2.4
8" x 8"	20	11.7
8" x 8"	25	7.5
8" x 8"	30	5.2
8" x 8"	33 4" Max.	4.2
10" x 10"	25	18.2
10" x 10"	30	12.7
10" x 10"	35	9.3
10" x 10"	41 8" Max.	6.6
12" x 12"	30	26.3
12" x 12"	35	19.3
12" x 12"	40	14.8
12" x 12"	45	11.7
12" x 12"	50 Max.	9.5

(1989 Ed.)

(7) When gin poles are spliced to increase their length, the splicing shall be made with heavy planking at least four feet long securely bolted to all four (4) sides of the pole. If splicing planks are spiked, they shall be securely lashed at the same points.

(8) Additional guy lines shall be attached at the point of splice.

[Order 74-26, § 296-155-555, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-560 Concrete bucket towers.** (1) A concrete bucket tower located inside a structure, and which is three feet or less from any scaffold or the edge of the shaftway or floor opening in which it is installed, shall be enclosed on all sides with heavy wire netting formed of number sixteen U.S. gauge one and one-half inch mesh. Wood slats placed vertically and spaced not more than one and one-half inches apart may be used instead of the netting.

The enclosure shall extend at least eight feet above such scaffold or floor.

(2) A concrete bucket tower located outside a structure shall be enclosed to a height of eight feet at lower landing with heavy wire netting formed of number sixteen U.S. gauge wire one and one-half inch mesh or other suitable material.

(3) Openings with platforms shall be formed at each floor level, and the runway leading to the tower shall be guarded with standard railings and toeboards.

(4) If the bucket is discharged into a chute, the chute shall be substantially constructed of wood or metal and extend from the tower to the point where the concrete is to be poured, or transferred to vehicles or hoppers, and the chute shall be substantially supported.

(5) The pit shall be drained and deep enough so that any spill from the bucket will fall below the blocking on which the bucket rests while being filled.

(6) Persons shall not be allowed to work in the pit without first resting the bucket on strong timbers supported on two sides of the tower.

(7) The bucket tower shall be securely guyed at two or more elevations as may be necessary.

(8) The guide rails shall be carefully aligned and kept in good condition to prevent the bucket being caught or clogged while being hoisted.

(9) The sheaves over which the cable passes shall be firmly secured to overhead sheave beams and supporting frame work and the sheaves shall be kept lubricated.

(10) The hoisting cable shall be frequently inspected and renewed when broken wires or other defects are discovered.

(11) A platform provided with standard railings and toeboards shall be constructed at the point where the concrete is dumped into the chute. A ladder shall be fastened to one side of the tower to enable a person to reach the platform in safety.

(12) Workers shall be prohibited from riding in or on the bucket.

[Order 74-26, § 296-155-560, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-565 Hoisting engines.** (1) All gearing on hoisting engines shall be enclosed. Steam piping

[Title 296 WAC—p 2033]



subject to contact shall be insulated and if electrical equipment is used, it shall be grounded.

(2) Hoisting engines shall be of ample capacity and equipped with brakes capable of sustaining one hundred and fifty percent of rated load for stopping and sustaining the maximum load in any position.

(3) Hoisting engines shall be protected against the weather and falling objects by a substantial cover.

(4) All hoisting equipment shall be frequently inspected, and brakes, gears and operating levers kept in working condition.

(5) Guards shall be provided to prevent persons coming in contact with hoisting cables.

(6) Brake drums shall be kept free of oil or grease.

(7) A positive operated pawl shall be used in addition to the brake to hold the load when it is suspended. Counter weight operated dogs are prohibited.

(8) Hoisting engines shall not be set up in the street when it can be avoided; but, if so located, they shall be completely housed.

(9) Only competent personnel shall operate material hoists.

(10) The operator shall not lift a load when a person is on the hoist, and all towers shall be posted to that effect, except as provided in other sections of this part.

(11) The operator shall be notified when any person goes up the tower ladder, or before any work is done on any part of the tower, overhead work, hoist or in the pit.

(12) The operator shall make daily inspections of all equipment before he starts operations.

(13) When the hoisting engine is located close to the building operation, it shall be covered with a strong plank roof covering to protect the operator from falling objects.

(14) Exhaust steam pipes shall discharge overhead so as not to obstruct the view of the operator or scald persons.

(15) In the operation of hoists, the operator shall always give a warning sign or signal before starting.

(16) When hoisting machinery is set on an elevated platform such platform shall be of substantial construction and standard guard rails and toeboards shall be provided along all open sides of the platform.

(17) Material hoists of more than one drum capacity shall be equipped with brake controls.

(18) A safety strap shall be provided on the foot block of all hoists.

(19) When electric motors are used for hoisting equipment, they shall be operated only by qualified personnel.

(a) Installations shall be made in accordance with provisions of local and national electrical safety codes, and shall be made by experienced workers only.

(b) Inclosed switches and fuses shall always be used.

(c) Switchboards shall be screened, and a sign placed warning unauthorized persons to keep clear.

[Order 74-26, § 296-155-565, filed 5/7/74, effective 6/6/74]

**WAC 296-155-570 Rigging--Wire rope.** (1) Whenever used in connection with work, employment,

[Title 296 WAC--p 2034]

occupations or uses to which these standards are applicable, wire rope shall not be subjected to loads in excess of one-fifth the breaking load as given in the schedule of the cable manufacturer.

(2) Any wire rope showing 10% of its wires broken in a three foot length shall not be used. When cables deteriorate through rusting, wear, undue strain or other conditions to the extent of 15% of their original strength, use of cable shall be discontinued.

(3) Wire rope shall be frequently inspected for wear and other defects which may reduce the strength below the point of safe operation.

(4) If wire rope is received in a coil it shall be rolled out, on a surface free from grit, like a hoop and straightened out before being put on the sheaves. If it is received on a reel, the reel shall be mounted on a spindle or turntable and the rope then unwound.

(5) Wire rope shall be lubricated. A lubricant recommended by a wire rope manufacturer shall be used.

(6) Wire rope shall be securely fastened to drums by zinc plugs or suitable clamps, and at least two full turns of the rope shall remain on the winding drum.

(7) Wire rope shall be wound evenly on the drum and not allowed to lap one layer on another in an irregular fashion.

(8) Care shall be taken to prevent friction of wire ropes with other objects which could cause chafing or breaking of wires.

(9) In attaching U-type cable clamps, the U shall always be placed over the short end of the cable.

(10) The clamp nuts shall be tightened up frequently during the operation to prevent slipping.

(11) Thimbles shall be used in cable eyes whenever practicable.

(12) Fair leads shall be used ahead of cable drums, whenever practicable, and the fleet angle kept as flat as possible to promote proper spooling.

(13) All running lines of hoisting equipment, located within seven (7) feet of the ground or working level shall be boxed, railed off or otherwise guarded, or the operating area restricted.

(14) Wire rope which has been welded or been subject to welding of any kind shall not be used.

(15) No open hook shall be used to hoist a bucket, cage, spreader, or skip, nor in any circumstances where the dislodgement of the hook could cause a risk of injury to workers. A safety-hook, mousing, or shackle shall be employed in such circumstances.

(16) When shackles are used, shackle pins shall be secured to prevent accidental withdrawal.

(17) Where a wedge socket connector is used as a wire rope terminal, a single wire rope clip shall be installed in accordance with WAC 296-155-330 (3)(g).

(18) The wire rope shall not be burned off with heat. This may weld the ends of the wires and strands together.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-570, filed 1/21/86; Order 74-26, § 296-155-570, filed 5/7/74, effective 6/6/74.]

(1989 Ed.)

**WAC 296-155-575 Helicopters and helicopter cranes.** (1) Helicopter regulations. Helicopter cranes shall be expected to comply with any applicable regulations of the Federal Aviation Administration.

(2) Briefing. Prior to each day's operation a briefing shall be conducted. This briefing shall set forth the plan of operation for the pilot and ground personnel.

(3) Slings and tag lines. Load shall be properly slung. Tag lines shall be of a length that will not permit their being drawn up into rotors. Pressed sleeve, swedged eyes, or equivalent means shall be used for all freely suspended loads to prevent hand splices from spinning open or cable clamps from loosening.

(4) Cargo hooks. All electrically operated cargo hooks shall have the electrical activating device so designed and installed as to prevent inadvertent operation. In addition, these cargo hooks shall be equipped with an emergency mechanical control for releasing the load. The hooks shall be tested prior to each day's operation to determine that the release functions properly, both electrically and mechanically.

(5) Personal protective equipment.

(a) Personal protective equipment for employees receiving the load shall consist of complete eye protection and hard hats secured by chinstraps.

(b) Loose-fitting clothing likely to flap in the downwash, and thus be snagged on hoist line, shall not be worn.

(6) Loose gear and objects. Every practical precaution shall be taken to provide for the protection of the employees from flying objects in the rotor downwash. All loose gear within 100 feet of the place of lifting the load, depositing the load, and all other areas susceptible to rotor downwash shall be secured or removed.

(7) Housekeeping. Good housekeeping shall be maintained in all helicopter loading and unloading areas.

(8) Operator responsibility. The helicopter operator shall be responsible for size, weight, and manner in which loads are connected to the helicopter. If, for any reason, the helicopter operator believes the lift cannot be made safely, the lift shall not be made.

(9) Hooking and unhooking loads. Employees shall not perform work under hovering craft except for that limited period of time necessary to guide, secure and unhook loads, or to hook loads. Regardless of whether the hooking or unhooking of a load takes place on the ground or a flat roof, or other location in an elevated work position in structural members, a safe means of access and egress, to include an unprogrammed emergency escape route or routes, shall be provided for the employees who are hooking or unhooking loads.

(10) Static charge. Static charge on the suspended load shall be dissipated with a grounding device before ground personnel touch the suspended load, or protective rubber gloves shall be worn by all ground personnel touching the suspended load.

(11) Weight limitation. The weight of an external load shall not exceed the manufacturer's rating.

(12) Ground lines. Hoist wires or other gear, except for pulling lines or conductors that are allowed to "pay

out" from a container or roll off a reel, shall not be attached to any fixed ground structure, or allowed to foul on any fixed structure.

(13) Visibility. When visibility is reduced by dust or other conditions, ground personnel shall exercise special caution to keep clear of main and stabilizing rotors. Precautions shall also be taken by the employer to eliminate as far as practical reduced visibility.

(14) Signal systems. Signal systems between aircrew and ground personnel shall be understood and checked in advance of hoisting the load. This applies to either radio or hand signal systems. Hand signals shall be as shown in Figure L-1.

(15) Approach distance. No unauthorized person shall be allowed to approach within 50 feet of the helicopter when the rotor blades are turning.

(16) Approaching helicopter. Whenever approaching or leaving a helicopter with blades rotating, all employees shall remain in full view of the pilot and keep in a crouched position. Employees shall avoid the area from the cockpit or cabin rearward unless authorized by the helicopter operator to work there.

(17) Personnel. Sufficient ground personnel shall be provided when required for safe helicopter loading and unloading operations.

(18) Communications. There shall be constant reliable communication between the pilot, and a designated employee of the ground crew who acts as a signalman during the period of loading and unloading. This signalman shall be distinctly recognizable from other ground personnel.

(19) Fires. Open fires shall not be permitted in an area that could result in such fires being spread by the rotor downwash.

(20) Refueling operations.

(a) Under no circumstances shall the refueling of any type helicopter with either aviation gasoline or Jet B (turbine-kerosene) type fuel be permitted while the engines are running.

(b) No unauthorized persons shall be allowed within fifty feet of the refueling operation or fueling equipment.

(c) A minimum of one thirty-pound fire extinguisher, or a combination of same, good for Class A, B and C fires, shall be provided within one hundred feet on the upwind side of the refueling operation.

(d) All fueling personnel shall be thoroughly trained in the refueling operation and in the use of available fire extinguishing equipment.

(e) There shall be no smoking, open flames, exposed flame heaters, flare pots or open flame lights for spark producing agents within fifty feet of the refueling area or fueling equipment. All entrances to the refueling area shall be posted with "NO SMOKING" signs.

(f) Due to the numerous causes of static electricity, it should be considered present at all times. Prior to starting refueling operations, the fueling equipment and the helicopter shall be grounded and the fueling nozzle shall be electrically bonded to the helicopter.

(i) Conductive hose shall not be used to accomplish the bonding.

(ii) All grounding and bonding connections shall be electrically and mechanically firm, to clean unpainted metal parts.

(g) To control spills:

(i) Fuel shall be pumped either by hand or power.

(ii) Pouring or gravity flow shall not be permitted.

(iii) Selfclosing nozzles shall not be dragged on the ground.

(h) In case of a spill, the fueling operation shall be immediately stopped until such time as the person in charge determines that it is safe to resume the refueling operation.

(i) When ambient temperatures have been in the one hundred degree F range for an extended period of time, all refueling of helicopters with the engines running shall be suspended until such time as conditions become suitable to resume refueling with the engines running.

(21) Hook on persons shall wear contrasting colored hard hats, with chinstraps, and high visibility vests or outer garments to enable the helicopter operator to readily identify their locations.

(22) Riding the load or hook of a helicopter is prohibited except in the case of emergency and then only with the proper safety gear.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-575, filed 1/21/86; Order 76-28, § 296-155-575, filed 9/28/76; Order 74-26, § 296-155-575, filed 5/7/74, effective 6/6/74.]

WAC 296-155-576 Figure L-1.

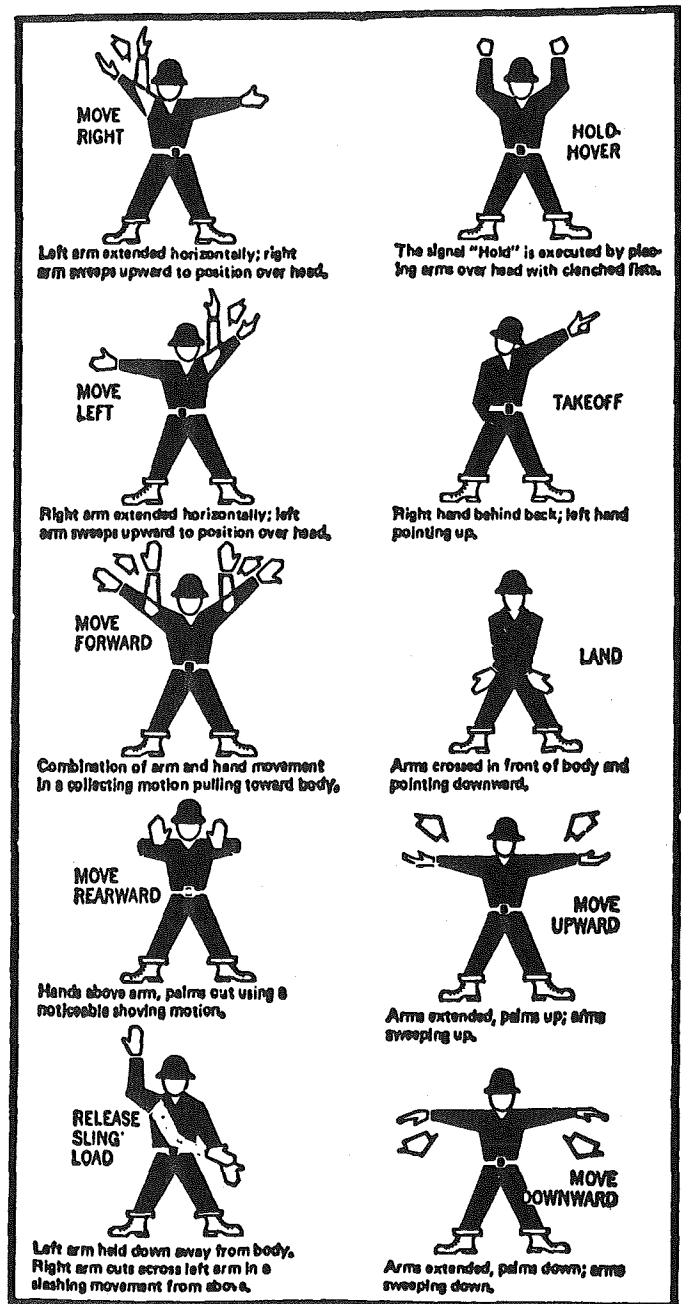


Figure L-1

HELICOPTER HAND SIGNALS

[Order 74-26, Figure L-1 (codified as WAC 296-155-576), filed 5/7/74, effective 6/6/74. Formerly WAC 296-155-575 (part).]

**WAC 296-155-580 Aerial lifts. (1) General requirements.**

(a) Unless otherwise provided in this section, aerial lifts acquired for use on or after the effective date of this section shall be designed and constructed in conformance with the applicable requirements of the American National Standard for "Vehicle Mounted Elevating and Rotating Work Platforms," ANSI A92.2-1979, including appendix. Aerial lifts acquired before the effective

date of this section, which do not meet the requirements of ANSI A92.2-1979, may not be used after January 1, 1976, unless they shall have been modified so as to conform with the applicable design and construction requirements of ANSI A92.2-1969. Aerial lifts include the following types of vehicle-mounted aerial devices used to elevate personnel to jobsites above ground: (i) Extensible boom platforms; (ii) aerial ladders, (iii) articulating boom platforms, (iv) vertical towers, and (v) a combination of any of the above. Aerial equipment may be made of metal, wood, fiberglass reinforced plastic (FRP), or other material; may be powered or manually operated; and are deemed to be aerial lifts whether or not they are capable of rotating about a substantially vertical axis.

(b) Aerial lifts may be "field modified" for uses other than those intended by the manufacturer provided the modification has been certified in writing by the manufacturer or by any other equivalent entity, such as a nationally recognized testing laboratory, to be in conformity with all applicable provisions of ANSI A92.2-1969 and this section and to be at least as safe as the equipment was before modification.

(c) Annual inspections. An annual inspection, including nondestructive testing of the stress points such as base and cylinder attachment points, shall be conducted.

(i) The tests shall be conducted by a certified testing laboratory or agency recognized by the department.

(ii) The employer shall maintain a permanent record of the results of such inspections for each aerial personnel boom and ladder vehicle. Such records shall be available at the work site.

(2) Specific requirements.

(a) Ladder trucks and tower trucks. Aerial ladders shall be secured in the lower traveling position by a locking device on top of the truck cab or truck framework, and the manually operated device at the base of the ladder before the truck is moved for highway travel.

(b) Extensible and articulating boom platforms.

(i) Lift controls shall be tested each day prior to use to determine the such controls are in safe working condition.

(ii) Only authorized persons shall operate an aerial lift.

(iii) Belting off to an adjacent pole, structure, or equipment while working from an aerial lift shall not be permitted.

(iv) Employees shall always stand firmly on the floor of the basket, and shall not sit or climb on the edge of the basket or use planks, ladders, or other devices for a work position.

(v) A body belt shall be worn and a lanyard attached to the boom or basket when working from an aerial lift.

(vi) Boom and basket load limits specified by the manufacturer shall not be exceeded.

(vii) The brakes shall be set and when outriggers are used, they shall be positioned on pads or a solid surface. Wheel chocks shall be installed before using an aerial lift on an incline, provided they can be safely installed.

(viii) An aerial lift truck shall not be moved when the boom is elevated in a working position with persons in the basket, except for equipment which is specifically designed for this type of operation in accordance with the provisions of subdivisions (a) and (b) of subsection (1) of this section.

(ix) Articulating boom and extensible boom platforms, primarily designed as personnel carriers, shall have both platform (upper) and lower controls. Upper controls shall be in or beside the platform within easy reach of the operator. Lower controls shall provide for over-riding the upper controls. Controls shall be plainly marked as to their function. Lower level controls shall not be operated unless permission has been obtained from the employee in the lift, except in case of emergency.

(x) Climbers shall not be worn while performing work from an aerial lift.

(xi) The insulated portion of an aerial lift shall not be altered in any manner that might reduce its insulating value.

(xii) Before moving an aerial lift for travel, the boom(s) shall be inspected to see that it is properly cradled and outriggers are in stowed position except as provided in item (viii) of this subdivision.

(c) Electrical tests. All electrical tests shall conform to the requirements of ANSI A92.2-1969 section 5. However, equivalent d.c. voltage tests may be used in lieu of the a.c. voltage specified in A92.2-1969; d.c. voltage tests which are approved by the equipment manufacturer or equivalent entity shall be considered an equivalent test for the purpose of this subdivision.

(d) Bursting safety factor. The provisions of the American National Standards Institute standard ANSI A92.2-1969, section 4.9 Bursting Safety Factor shall apply to all critical hydraulic and pneumatic components. Critical components are those in which a failure would result in a free fall or free rotation of the boom. All noncritical components shall have bursting safety factor of at least 2 to 1.

(e) Welding standards. All welding shall conform to the following standards as applicable:

(i) Standard Qualification Procedure, AWS B3.0-41.

(ii) Recommended Practices for Automotive Welding Design, AWS D8.4-61.

(iii) Standard Qualification of Welding Procedures and Welders for Piping and Tubing, AWS D10.9-69.

(iv) Specifications for Welding Highway and Railway Bridges, AWS D2.0-69.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-580, filed 1/21/86; Order 74-26, § 296-155-580, filed 5/7/74, effective 6/6/74.]

WAC 296-155-59901 Table 1.

**TABLE 1**  
STANDARD 6 x 7 WIRE ROPE<sup>1</sup>

Diameter	Approximate Weight Per Foot	Breaking Strength in Tons of 2,000 Pounds		
		Improved Plow Steel	Plow Steel	Mild Plow Steel
Inches	Pounds			
1/4	0.094	2.64	2.30	3.10
5/16	.15	4.10	3.56	3.10
3/8	.21	5.86	5.10	4.43
7/16	.29	7.93	6.90	6.00
1/2	.38	10.3	8.96	7.79
9/16	.48	13.0	11.3	9.82
5/8	.59	15.9	13.9	12.0
3/4	.84	22.7	19.8	17.2
7/8	1.15	30.7	26.7	23.2
1	1.50	39.7	34.5	30.0
1-1/8	1.90	49.8	43.3	37.7
1-1/4	2.34	61.0	53.0	46.1
1-3/8	2.84	73.1	63.6	55.3
1-1/2	3.38	86.2	75.0	65.2

<sup>1</sup> For these ropes with steel centers, add 7 1/2% to the above strengths. For these ropes when galvanized, deduct 10% from the above strengths.

[Order 74-26, § 296-155-580 (part), Table 1 (codified as WAC 296-155-59901), filed 5/7/74, effective 6/6/74.]

WAC 296-155-59902 Table 2.

**TABLE 2**  
STANDARD 6 x 19 WIRE ROPE<sup>1</sup>

Diameter	Approximate Weight Per Foot	Breaking Strength in Tons of 2,000 Pounds		
		Improved Plow Steel	Plow Steel	Mild Plow Steel
Inches	Pounds			
1/4	0.10	2.74	2.39	2.07
5/16	.16	4.26	3.71	3.22
3/8	.23	6.10	5.31	4.62
7/16	.31	8.27	7.19	6.25
1/2	.40	10.7	9.35	8.13
9/16	.51	13.5	11.8	10.2
5/8	.63	16.7	14.5	12.6
3/4	.90	23.8	20.7	18.0
7/8	1.23	32.2	28.0	24.3
1	1.60	41.8	36.4	31.6
1-1/8	2.03	52.6	45.7	39.8

TABLE 2--cont.

Diameter	Approximate Weight Per Foot	Breaking Strength in Tons of 2,000 Pounds		
		Improved Plow Steel	Plow Steel	Mild Plow Steel
Inches	Pounds			
1-1/4	2.50	64.6	56.2	48.8
1-3/8	3.03	77.7	67.5	58.8
1-1/2	3.60	92.0	80.0	69.6
1-5/8	4.23	107.0	93.4	81.2
1-3/4	4.90	124.0	108.0	93.6
1-7/8	5.63	141.0	123.0	107.0
2	6.40	160.0	139.0	121.0
2-1/8	7.23	179.0	156.0	...
2-1/4	8.10	200.0	174.0	...
2-1/2	10.0	244.0	212.0	...
2-3/4	12.10	292.0	254.0	...

<sup>1</sup> For these ropes with steel centers, add 7 1/2% to the above strengths. For these ropes when galvanized, deduct 10% from the above strengths.

[Order 74-26, § 296-155-580 (part), Table 2 (codified as WAC 296-155-59902), filed 5/7/74, effective 6/6/74.]

WAC 296-155-59903 Table 3.

**TABLE 3**  
STANDARD 8 x 19 WIRE ROPE<sup>1</sup>

Diameter	Approximate Weight Per Foot	Breaking Strength in Tons of 2,000 Pounds	
		Improved Plow Steel	Plow Steel
Inches	Pounds		
1/4	0.09	2.35	2.04
5/16	.14	3.65	3.18
3/8	.20	5.24	4.55
7/16	.28	7.09	6.17
1/2	.36	9.23	8.02
9/16	.46	11.6	10.1
5/8	.57	14.3	12.4
3/4	.82	20.5	17.8
7/8	1.11	27.7	24.1
1	1.45	36.0	31.3
1-1/8	1.84	45.3	39.4
1-1/4	2.27	55.7	48.4
1-3/8	2.74	67.1	58.3
1-1/2	3.26	79.4	69.1

<sup>1</sup> For these ropes with steel centers, add 7 1/2% to the above strengths. For these ropes when galvanized, deduct 10% from the above strengths.

[Order 74-26, § 296-155-580 (part), Table 3 (codified as WAC 296-155-59903), filed 5/7/74, effective 6/6/74.]

WAC 296-155-59904 Table 4.

TABLE 4  
STANDARD 6 x 37 WIRE ROPE<sup>1</sup>

Diameter	Approximate Weight Per Foot	Breaking Strength in Tons of 2,000 Pounds	
		Improved Plow Steel	Plow Steel
Inches	Pounds		
1/4	0.10	2.59	2.25
5/16	.16	4.03	3.50
3/8	.22	5.77	5.02
7/16	.30	7.82	6.80
1/2	.39	10.2	8.85
9/16	.49	12.9	11.2
5/8	.61	15.8	13.7
3/4	.87	22.6	19.6
7/8	1.19	30.6	26.6
1	1.55	39.8	34.6
1-1/8	1.96	50.1	43.5
1-1/4	2.42	61.5	53.5
1-3/8	2.93	74.1	64.5
1-1/2	3.49	87.9	76.4
1-5/8	4.09	103.0	89.3
1-3/4	4.75	119.0	103.0
1-7/8	5.45	136.0	118.0
2	6.20	154.0	134.0
2-1/8	7.00	173.0	150.0
2-1/4	7.85	193.0	168.0
2-1/2	9.69	236.0	205.0
2-3/4	11.72	284.0	247.0
3	13.95	335.0	291.0
3-1/4	16.37	390.0	339.0
3-1/2	19.400	449.0	390.0

<sup>1</sup> For these ropes with steel centers, add 7 1/2% to the above strengths. For these ropes when galvanized, deduct 10% from the above strengths.

[Order 74-26, § 296-155-580 (part), Table 4 (codified as WAC 296-155-59904), filed 5/7/74, effective 6/6/74.]

WAC 296-155-59905 Table 5.

TABLE 5  
STANDARD 6 x 19 ELEVATOR ROPE

DIAMETER	Approximate Weight Per Foot	BREAKING STRENGTH		
		Iron	Traction Steel	High-Rise Traction Steel
Inches	Pounds	Pounds	Pounds	Pounds
3/16	0.06	1,300	...	...
1/4	.10	2,200	3,600	...
5/16	.16	3,200	5,600	...
3/8	.23	5,000	8,200	...
7/16	.31	6,400	11,000	...
1/2	.40	8,400	14,500	...
9/16	.51	10,600	18,500	...
5/8	.63	12,800	23,000	...
11/16	.76	...	27,000	30,000
3/4	.90	18,200	32,000	...
13/16	1.06	...	37,000	46,000
7/8	1.23	24,800	42,000	...
15/16	1.41	...	48,000	60,000
1	1.60	32,000	54,000	...
1-1/16	1.81	...	61,000	...

[Order 74-26, § 296-155-580 (part), Table 5 (codified as WAC 296-155-59905), filed 5/7/74, effective 6/6/74.]

WAC 296-155-59906 Table 6.

TABLE 6  
STANDARD 8 x 19 ELEVATOR ROPE

DIAMETER	Approximate Weight Per Foot	BREAKING STRENGTH		
		Iron	Traction Steel	High-Rise Traction Steel
Inches	Pounds	Pounds	Pounds	Pounds
3/16	0.05	1,000	...	...
1/4	.09	1,800	3,600	...
5/16	.14	2,900	5,600	...
3/8	.20	4,200	8,200	...
7/16	.28	5,600	11,000	...
1/2	.36	7,200	14,500	...
9/16	.46	9,200	18,500	...
5/8	.57	11,200	23,000	...
11/16	.69	...	27,000	30,000
3/4	.82	16,000	32,000	...
13/16	.96	...	37,000	46,000

TABLE 6--cont.

DIAMETER	Approximate Weight Per Foot	BREAKING STRENGTH		
		Iron	Traction Steel	High-Rise Traction Steel
	Pounds	Pounds	Pounds	Pounds
Inches				
7/8	1.11	21,400	42,000	...
15/16	1.27	...	48,000	60,000
1	1.45	28,000	54,000	...
1-1/16	1.64	...	61,000	...

[Order 74-26, § 296-155-580 (part), Table 6 (codified as WAC 296-155-59906), filed 5/7/74, effective 6/6/74.]

WAC 296-155-59907 Table 7.

TABLE 7

STANDARD 5 x 19 MARLINE CLAD ROPE<sup>1</sup>

DIAMETER		Approximate Weight Per Foot	Breaking Strength in Tons of 2,000 Pounds	
Before Serving	After Serving		Plow Steel	Mild Plow Steel
Inches	Inches	Pounds		
1/4	9/16	0.21	2.17	1.89
5/16	5/8	.28	3.37	2.93
3/8	11/16	.36	4.82	4.20
7/16	3/4	.42	6.53	5.68
1/2	13/16	.51	8.50	7.39
9/16	7/8	.62	10.7	9.31
5/8	1	.81	13.2	11.4
3/4	1-1/8	1.10	18.8	16.4
7/8	1-1/4	1.70	25.5	22.1
1	1-3/8	1.32	33.7	28.7
1-1/8	1-1/2	2.12	41.6	36.2
1-1/4	1-5/8	2.58	51.1	44.4
1-3/8	1-3/4	3.14	61.4	53.4
1-1/2	1-7/8	3.69	...	...
1-5/8	2	4.29	...	...
1-3/4	2-1/8	5.00	...	...

<sup>1</sup> For these ropes with steel centers, add 7 1/2% to the above strengths. For these ropes when galvanized, deduct 10% from the above strengths.

[Order 74-26, § 296-155-580 (part), Table 7 (codified as WAC 296-155-59907), filed 5/7/74, effective 6/6/74.]

WAC 296-155-59908 Table 8.

TABLE 8

STANDARD 18 x 7 NONROTATING ROPE

DIAMETER	Approximate Weight Per Foot	Breaking Strength in Tons of 2,000 Pounds	
		Improved Plow Steel	Plow Steel
Inches	Pounds		
3/8	0.24	5.59	4.86
7/16	.33	7.58	6.59
1/2	.43	9.85	8.57
9/16	.55	12.4	10.8
5/8	.68	15.3	13.3
3/4	.97	21.8	19.0
7/8	1.32	29.5	25.7
1	1.73	38.3	33.3
1-1/8	2.19	48.2	41.9
1-1/4	2.70	59.2	51.5
1-3/8	3.27	71.3	62.0
1-1/2	3.89	84.4	73.4
1-5/8	4.57	98.4	85.6
1-3/4	5.30	114.0	98.8

[Order 74-26, § 296-155-580 (part), Table 8 (codified as WAC 296-155-59908), filed 5/7/74, effective 6/6/74.]

WAC 296-155-59909 Table 9.

TABLE 9

STANDARD 6 x 12 GALVANIZED RUNNING ROPE AND HAWSERS

DIAMETER	Approximate Weight Per Foot	Breaking Strength in Tons of 2,000 Pounds		
		Galvanized Improved Plow Steel	Galvanized Plow Steel	Galvanized Iron
Inches	Pounds			
5/16	0.10	2.34	2.04	0.905
3/8	.15	3.36	2.92	1.30
7/16	.20	4.55	3.95	1.76
1/2	.26	5.91	5.14	2.28
9/16	.33	7.45	6.48	2.88
5/8	.41	9.16	7.97	3.54
3/4	.59	13.1	11.4	5.06
13/16	.69	15.3	13.3	5.92
7/8	.80	17.7	15.4	6.85
1	1.05	23.0	20.0	8.89
1-1/16	1.19	25.9	22.5	10.0
1-1/8	1.33	29.0	25.2	...
1-3/16	1.48	32.2	28.0	...
1-1/4	1.64	35.6	30.9	...



TABLE 9--cont.

DIAMETER	Approximate Weight Per Foot	Breaking Strength in Tons of 2,000 Pounds		
		Galvanized Improved Plow Steel	Galvanized Plow Steel	Galvanized Iron
Inches	Pounds			
1-3/8	1.99	42.8	37.2	...
1-7/16	2.17	46.7	40.6	...
1-1/2	2.36	50.7	44.1	...
1-5/8	2.77	59.2	51.4	...
1-11/16	2.99	63.6	55.3	...
1-3/4	3.22	68.3	59.4	...
1-15/16	3.45	78.0	63.5	...
1-15/16	3.94	83.0	72.2	...
2	4.20	88.2	76.7	...
2-1/16	4.47	93.6	81.4	...

[Order 74-26, § 296-155-580 (part), Table 9 (codified as WAC 296-155-59909), filed 5/7/74, effective 6/6/74.]

WAC 296-155-59910 Table 10.

TABLE 10

STANDARD 6 x 25 GALVANIZED STEEL MOORING LINES AND HAWSERS

DIAMETER	Approximate Weight Per Foot	Breaking Strength in Tons of 2,000 Pounds	
		Galvanized Improved Plow Steel	Galvanized Plow Steel
Inches	Pounds		
3/8	0.194	4.77	4.14
1/2	.35	8.40	7.30
5/8	.54	13.0	11.3
3/4	.78	18.6	16.2
13/16	.91	21.8	19.0
7/8	1.06	25.2	21.9
1	1.38	32.8	28.5
1-1/16	1.56	36.9	32.1
1-1/8	1.75	41.2	35.9
1-3/16	1.95	45.9	39.9
1-1/4	2.16	50.7	44.1
1-3/8	2.61	61.0	53.0
1-7/16	2.85	66.5	57.9
1-1/2	3.11	72.3	62.9
1-5/8	3.64	84.5	73.4
1-11/16	3.93	90.9	79.0

TABLE 10--cont.

DIAMETER	Approximate Weight Per Foot	Breaking Strength in Tons of 2,000 Pounds	
		Galvanized Improved Plow Steel	Galvanized Plow Steel
Inches	Pounds		
1-3/4	4.23	97.5	84.8
1-13/16	4.53	104.0	90.8
1-15/16	5.18	119.0	103.0
2	5.52	126.0	110.0
2-1/16	5.87	134.0	116.0

[Order 74-26, § 296-155-580 (part), Table 10 (codified as WAC 296-155-59910), filed 5/7/74, effective 6/6/74.]

WAC 296-155-59911 Table 11.

TABLE 11

STANDARD 6 x 37 GALVANIZED STEEL HAWSERS

DIAMETER	Approximate Weight Per Foot	Breaking Strength in Tons of 2,000 Pounds	
		Improved Plow Steel	Plow Steel
Inches	Pounds		
3/4	0.87	21.0	18.2
13/16	1.02	24.5	21.3
7/8	1.19	28.4	24.7
1	1.55	36.9	32.1
1-1/16	1.75	41.6	36.1
1-1/8	1.96	46.5	40.4
1-3/16	2.19	51.7	44.9
1-1/4	2.42	57.1	49.7
1-3/8	22.93	68.8	59.8
1-7/16	3.20	75.0	65.3
1-1/2	3.49	81.5	70.9
1-5/8	4.09	95.3	82.9
1-11/16	4.41	103.0	89.2
1-3/4	4.75	110.0	95.7
1-13/16	5.09	118.0	102.0
1-15/16	5.82	134.0	117.0
2	6.20	143.0	124.0
2-1/16	6.59	151.0	132.0
2-1/8	7.00	160.0	139.0
2-1/4	7.85	179.0	156.0
2-5/16	8.29	189.0	164.0
2-3/8	8.74	199.0	173.0

[Order 74-26, § 296-155-580 (part), Table 11 (codified as WAC 296-155-59911), filed 5/7/74, effective 6/6/74.]

WAC 296-155-59912 Table 12.

**TABLE 12**  
STANDARD 6 x 25 TYPE "B" FLATTENED STRAND WIRE ROPE<sup>1</sup>

DIAMETER	Approximate Weight Per Foot	Breaking Strength in Tons of 2,000 Pounds	
		Improved Plow Steel	Plow Steel
Inches	Pounds		
3/8	0.25	6.71	...
1/2	.45	11.8	8.94
9/16	.57	14.9	11.2
5/8	.70	18.3	13.9
3/4	1.01	26.2	19.8
7/8	1.39	35.4	26.8
1	1.80	46.0	34.8
1-1/8	2.28	57.9	43.8
1-1/4	2.81	71.0	53.7
1-3/8	3.40	85.5	...
1-1/2	4.05	101.0	...
1-5/8	4.75	118.0	...
1-3/4	5.51	136.0	...
2	7.20	176.0	...
2-1/4	9.10	220.0	...
2-1/2	11.20	269.0	...
2-3/4	13.60	321.0	...

<sup>1</sup> For these ropes when galvanized, deduct 10 percent from the above strengths.

[Order 74-26, § 296-155-580 (part), Table 12 (codified as WAC 296-155-59912), filed 5/7/74, effective 6/6/74.]

WAC 296-155-59913 Table 13.

**TABLE 13**  
STANDARD 6 x 30 TYPE "G" FLATTENED STRAND WIRE ROPE<sup>1</sup>

DIAMETER	Approximate Weight Per Foot	Breaking Strength in Tons of 2,000 Pounds	
		Improved Plow Steel	Plow Steel
Inches	Pounds		
5/8	0.70	18.3	13.9
3/4	1.01	26.2	19.8
7/8	1.39	35.4	26.8
1	1.80	46.0	34.8
1-1/8	2.28	57.9	43.8
1-1/4	2.81	71.0	53.7
1-3/8	3.40	85.5	...
1-1/2	4.05	101.0	...
1-5/8	4.75	118.0	...
1-3/4	5.51	136.0	...
2	7.20	176.0	...

TABLE 13--cont.

DIAMETER	Approximate Weight Per Foot	Breaking Strength in Tons of 2,000 Pounds	
		Improved Plow Steel	Plow Steel
Inches	Pounds		
2-1/4	9.10	220.0	...
2-1/2	11.20	269.0	...
2-3/4	13.60	321.0	...

<sup>1</sup> For these ropes with steel centers, add 7 1/2% to above strengths.

[Order 74-26, § 296-155-580 (part), Table 13 (codified as WAC 296-155-59913), filed 5/7/74, effective 6/6/74.]

WAC 296-155-59914 Table 14.

**TABLE 14**  
STANDARD 6 x 8 TYPE "D" FLATTENED STRAND WIRE ROPE

DIAMETER	Approximate Weight Per Foot	Breaking Strength in Tons of 2,000 Pounds	
		Improved Plow Steel	Plow Steel
Inches	Pounds		
1/2	0.45	11.1	8.37
5/8	.70	17.1	12.9
3/4	1.01	24.4	18.5
7/8	1.39	33.0	24.9
1	1.80	42.7	32.3
1-1/8	2.28	53.5	40.5
1-1/4	2.81	65.5	49.5
1-3/8	3.40	78.6	59.4
1-1/2	4.05	92.7	70.1

[Order 74-26, § 296-155-580 (part), Table 14 (codified as WAC 296-155-59914), filed 5/7/74, effective 6/6/74.]

WAC 296-155-59915 Table 15.

**TABLE 15**  
STANDARD 6 x 6 x 7 TILLER ROPE<sup>1</sup>

DIAMETER	Approximate Weight Per Foot	Breaking Strength in Tons of 2,000 Pounds	
		Plow Steel	Iron
Inches	Pounds		
1/4	0.07	1.31	0.584
5/16	.11	2.05	.908
3/8	.16	2.93	1.30
7/16	.21	3.98	1.77
1/2	.28	5.18	2.30

TABLE 15--cont.

DIAMETER	Approximate Weight Per Foot	Breaking Strength in Tons of 2,000 Pounds	
		Plow Steel	Iron
Inches	Pounds		
9/16	.35	6.53	2.90
5/8	.43	8.04	3.57

<sup>1</sup>For these ropes with steel centers, add 7 1/2% to above strengths.

[Order 74-26, § 296-155-580 (part), Table 15 (codified as WAC 296-155-59915), filed 5/7/74, effective 6/6/74.]

WAC 296-155-59916 Table 16.

TABLE 16

STANDARD 9 x 4 GALVANIZED MAST ARM ROPE

Diameter Inches	Approximate Weight Per Foot Pounds	Breaking Strength In Pounds
1/4	0.070	1,100
5/16	.107	1,530
3/8	.158	2,200

[Order 74-26, § 296-155-580 (part), Table 16 (codified as WAC 296-155-59916), filed 5/7/74, effective 6/6/74.]

WAC 296-155-59917 Table 17.

TABLE 17

STANDARD FLAT ROPE

Width and Thickness	Number of Ropes	Approximate Weight Per Foot	Breaking Strength in Tons of 2,000 Pounds	
			Plow Steel	Mild Plow Steel
Inches		Pounds		
1/4 x 1-1/2	7	0.69	16.8	14.6
1/4 x 2	9	.88	21.7	18.8
1/4 x 2-1/2	11	1.15	26.5	23.0
1/4 x 3	13	1.34	31.3	27.2
5/16 x 1-1/2	5	.77	18.5	16.0
5/16 x 2	7	1.05	25.8	22.4
5/16 x 2-1/2	9	1.33	33.2	28.8
5/16 x 3	11	1.61	40.5	35.3
5/16 x 3-1/2	13	1.89	47.9	41.7
5/16 x 4	15	2.17	55.3	48.1
3/8 x 2	6	1.25	31.4	27.3
3/8 x 2-1/2	8	1.64	41.8	36.4
3/8 x 3	9	1.84	47.1	40.9

TABLE 17--cont.

Width and Thickness	Number of Ropes	Approximate Weight Per Foot	Breaking Strength in Tons of 2,000 Pounds	
			Plow Steel	Mild Plow Steel
Inches		Pounds		
3/8 x 3-1/2	11	2.23	57.5	50.0
3/8 x 4	12	2.44	62.7	54.6
3/8 x 4-1/2	14	2.83	73.2	63.7
3/8 x 5	15	3.03	78.4	68.2
3/8 x 5-1/2	17	3.42	88.9	77.3
3/8 x 6	18	3.63	94.1	81.9
1/2 x 2-1/2	6	2.13	54.5	47.4
1/2 x 3	7	2.47	63.6	55.4
1/2 x 3-1/2	8	2.82	72.7	63.3
1/2 x 4	9	3.16	81.8	71.2
1/2 x 4-1/2	10	3.82	90.9	79.1
1/2 x 5	12	4.16	109.0	94.9
1/2 x 5-1/2	13	4.50	118.0	103.0
1/2 x 6	14	4.85	127.0	111.0
1/2 x 7	16	5.85	145.0	126.0
5/8 x 3-1/2	6	3.40	85.8	74.6
5/8 x 4	7	3.95	100.0	87.1
5/8 x 4-1/2	8	4.50	114.0	99.5
5/8 x 5	9	5.04	129.0	112.0
5/8 x 5-1/2	10	5.59	143.0	124.0
5/8 x 6	11	6.14	157.0	137.0
5/8 x 7	13	7.23	186.0	162.0
5/8 x 8	15	8.32	214.0	186.0
3/4 x 5	8	6.50	165.0	143.0
3/4 x 6	9	7.31	185.0	161.0
3/4 x 7	10	8.13	206.0	179.0
3/4 x 8	11	9.70	227.0	197.0
7/8 x 5	7	7.50	190.0	165.0
7/8 x 6	8	8.56	217.0	188.0
7/8 x 7	9	9.63	244.0	212.0
7/8 x 8	10	10.69	271.0	236.0

[Order 74-26, § 296-155-580 (part), Table 17 (codified as WAC 296-155-59917), filed 5/7/74, effective 6/6/74.]

WAC 296-155-59918 Table 18.

TABLE 18

STANDARD 6 x 12 MARLINE CLAD GRAIN-SHOVEL ROPE

Before Serving Inches	After Serving Inches	Approximate Weight Per Foot Pounds	Breaking Strength Tons of 2,000 Pounds
3/4	5/8	0.25	2.50
7/8	3/4	.43	5.50

[Order 74-26, § 296-155-580 (part), Table 18 (codified as WAC 296-155-59918), filed 5/7/74, effective 6/6/74.]

## WAC 296-155-59919 Table 19.

TABLE 19  
STANDARD 6 x 7 IRON, BRIGHT, AND  
GALVANIZED SASH CORDS

DIAMETER Inches	BREAKING STRENGTH			
	Approximate Weight Per Foot Pounds	Hard Drawn		Annealed (iron)
		Bright	Galvanized	Bright or Galvanized
1/16	0.006	140	126	77
3/32	.103	315	283	172
1/8	.023	560	504	306
5/32	.038	840	756	478
3/16	.053	1,150	1,035	688
7/32	.072	1,570	1,413	940
1/4	.094	2,040	1,836	1,225

[Order 74-26, § 296-155-580 (part), Table 19 (codified as WAC 296-155-59919), filed 5/7/74, effective 6/6/74.]

## WAC 296-155-59920 Table 20.

TABLE 20  
STANDARD 6 x 7 GALVANIZED  
IRON RIGGING AND GUY ROPE

Diameter Inches	Approximate Weight Per Foot Pounds	Breaking Strength in Tons of 2,000 Pounds
6 Strands:		
1/4	0.94	0.918
5/16	.15	1.42
3/8	.21	2.04
7/16	.29	2.76
1/2	.38	3.58
9/16	.48	4.51
5/8	.59	5.54
3/4	.84	7.90
13/16	.99	9.23
7/8	1.15	10.7
1	1.50	13.8
1 1/16	1.70	15.5
1 1/8	1.90	17.3
1 3/16	2.12	19.2
1 1/4	2.34	21.2

[Order 74-26, § 296-155-580 (part), Table 20 (codified as WAC 296-155-59920), filed 5/7/74, effective 6/6/74.]

[Title 296 WAC—p 2044]

## Part M

MOTOR VEHICLES, MECHANIZED EQUIPMENT,  
AND MARINE OPERATIONS

## WAC

296-155-600	Definitions applicable to this part.
296-155-605	Equipment.
296-155-610	Motor vehicles.
296-155-615	Material handling equipment.
296-155-617	Servicing multipiece and single-piece rim wheels.
296-155-61701	Scope.
296-155-61703	Definitions.
296-155-61705	Employee training.
296-155-61707	Tire servicing equipment.
296-155-61709	Wheel component acceptability.
296-155-61711	Safe operating procedure—Multipiece rim wheels.
296-155-61713	Safe operating procedure—Single-piece rim wheels.
296-155-620	Pile driving equipment.
296-155-625	Site clearing.
296-155-630	Marine operations and equipment.

**WAC 296-155-600 Definitions applicable to this part.** (1) "Apron" means the area along the waterfront edge of the pier or wharf.

(2) "Bearing cap" means:

(a) A slab of reinforced concrete or a heavy timber and plank platform covering the top of a group of piles for the purpose of tying them together and transmitting to them as a group the superimposed load.

(b) A metal plate placed across the top of a steel tube pile to distribute the load from the steel tube to the concrete.

(3) "Bearing pile" means a column of wood, metal or concrete or a combination of two or more of these materials, driven, jacked, or sunk with a water jet, into the earth to transmit and distribute loads to strata below the surface.

(4) "Bulwark" means the side of a ship above the upper deck.

(5) "Caisson pile" means a concrete pile case in an outer casing consisting of a series of telescoping steel tubes, the top section being the largest and usually twenty inches or more in diameter.

(6) "Coaming" means the raised frame, as around a hatchway in the deck, to keep out water.

(7) "Composite pile" means a pile which consists of a concrete pile superimposed on a wood pile.

(8) "Jacob's ladder" means a marine ladder of rope or chain with wooden or metal rungs.

(9)(a) A "pedestal type" concrete pile means a cast-in-place pile with an enlarged (mushroom) base or foot.

(b) A "tapered type" concrete pile means a cast-in-place pile cast in a tapered metal shell.

(10) "Precast concrete pile" means a pile which is cast in a form above ground.

(11) "Driving cap" means a device placed on the top of a pile to prevent its breakage or injury during the driving operation.

(12) "H-pile" means a pile formed of a structural steel column of "H" section.

(13) "Pile driver" means a device or piece of equipment used in driving piles.

(14) "Pretest or jack pile" means a steel cylinder pile driven in section beneath an existing building and filled with concrete.

(15) "Rail," for the purpose of WAC 296-155-630, means a light structure serving as a guard at the outer edge of a ship's deck.

(16) "Sheet piling" means a continuous vertical barricade consisting of squared timbers driven edge to edge, either square edged or tongued and grooved, or of a series of inter-locking steel shapes, to form a temporary wall about an excavation, and shored and braced as necessary.

(17) "Steel-tube" means a concrete-filled steel cylinder, consisting of an open or closed-end steel tube or cylinder.

(18) "Wood pile" means a pile which is formed from the trunk of a tree or dimension timbers.

[Order 74-26, § 296-155-600, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-605 Equipment. (1) General requirements.**

(a) All equipment left unattended at night, adjacent to a highway in normal use, or adjacent to construction areas where work is in progress, shall have appropriate lights or reflectors, or barricades equipped with appropriate lights or reflectors, to identify the location of the equipment.

(b) All tire servicing of multi-piece and single-piece rim wheels are subject to the requirements of WAC 296-155-61701 through 296-155-61713.

(c)(i) Heavy machinery, equipment, or parts thereof, which are suspended or held aloft by use of slings, hoists, or jacks shall be substantially blocked or cribbed to prevent falling or shifting before employees are permitted to work under or between them. Bulldozer and scraper blades, end-loader buckets, dump bodies, and similar equipment, shall be either fully lowered or blocked when being repaired or when not in use. All controls shall be in a neutral position, with the motors stopped and brakes set, unless work being performed required otherwise.

(ii) Whenever the equipment is parked, the parking brake shall be set. Equipment parked on inclines shall have the wheels chocked and the parking brake set.

(d) The use, care and charging of all batteries shall conform to the requirements of part I of this chapter.

(e) All cab glass shall be safety glass, or equivalent, that introduces no visible distortion affecting the safe operation of any machine covered by this part.

(f) All equipment covered by this part shall comply with the requirements of WAC 296-155-525 (2)(e) when working or being moved in the vicinity of power lines or energized transmitters.

(g) Where traffic is diverted onto dusty surfaces, good visibility shall be maintained by the suppression of dust, through the periodic application of oil or water to the grade surface, as required.

(h) No equipment, vehicle, tool, or individual shall operate within 10 feet of any power line or electrical distribution equipment except in conformity with the requirements of WAC 296-155-525 (2)(e).

(2) Specific requirements. (Reserved.)

[Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-605, filed 1/21/86; Order 74-26, § 296-155-605, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-610 Motor vehicles. (1) Coverage.** Motor vehicles as covered by this part include any vehicles that operate on a construction site. The requirements of this section do not apply to equipment for which rules are prescribed in WAC 296-155-615.

(2) General requirements.

(a) All vehicles shall have a service brake system, an emergency brake system, and a parking brake system. These systems may use common components, and shall be maintained in operable condition.

(b) Before leaving a motor vehicle unattended:

(i) The motor shall be stopped.

(ii) Parking brake engaged and wheels turned into curb or berm when parked on an incline.

(iii) When parking on an incline and there is no curb or berm, the wheels shall be chocked or otherwise secured.

(c)(i) Whenever visibility conditions warrant additional light, all vehicles, or combinations of vehicles, in use shall be equipped with at least two headlights and two taillights in operable condition.

(ii) All vehicles, or combination of vehicles, shall have brake lights in operable condition regardless of light conditions.

(d) All vehicles shall be equipped with an adequate audible warning device at the operator's station and in an operable condition.

(e) No employer shall allow the use of any motor vehicle equipment having an obstructed view to the rear unless:

(i) Vehicles other than passenger cars and pickups shall have an automatic reverse signal alarm audible above the surrounding noise level no less than fifteen feet from the rear of the vehicle or:

(ii) The vehicle is backed up only when an observer signals that it is safe to do so.

(f) All vehicles with cabs shall be equipped with windshields, powered wipers, and rear view mirrors. Cracked and broken glass shall be replaced. Vehicles operating in areas or under conditions that cause fogging or frosting of the windshields shall be equipped with operable defogging or defrosting devices.

(g) All haulage vehicles, whose pay load is loaded by means of cranes, power shovels, loaders, or similar equipment, shall have a cab shield and/or canopy adequate to protect the operator from shifting or falling materials.

(h) Tools and material shall be secured to prevent movement when transported in the same compartment with employees.

(i) Vehicles used to transport employees shall have seats firmly secured and adequate for the number of employees to be carried.

(j) Seat belts and anchorages meeting the requirements of 49 CFR Part 571 (Department of Transportation, Federal Motor Vehicle Safety Standards) shall be installed in all motor vehicles.

(k) Trucks with dump bodies or raiseable platforms, beds, or boxes shall be equipped with positive means of support, permanently attached, and capable of being locked in position to prevent accidental lowering of the body while maintenance or inspection work is being done.

(l) Operating levers, controlling hoisting or dumping devices on haulage bodies, shall be equipped with a latch or other device which will prevent accidental starting or tripping of the mechanism.

(m) Trip handles for tailgates of dump trucks shall be so arranged that, in dumping, the operator will be in the clear.

(n) All rubber-tired motor vehicle equipment manufactured on or after May 1, 1972, shall be equipped with fenders. All rubber-tired motor vehicle equipment manufactured before May 1, 1972, shall be equipped with fenders not later than October 1, 1974. Mud flaps may be used in lieu of fenders whenever motor vehicle equipment is not designed for fenders.

(o) All vehicles in use shall be checked at the beginning of each shift to assure that the following parts, equipment, and accessories are in safe operating condition and free of apparent damage that could cause failure while in use: Service brakes, including trailer brake connections; parking system (hand brake); emergency stopping system (brakes); tires; horn; steering mechanism; coupling devices; seat belts; operating controls; and safety devices. All defects shall be corrected before the vehicle is placed in service. These requirements also apply to equipment such as lights, reflectors, windshield wipers, defrosters, fire extinguishers, steps and handholds for vehicle access, etc., where such equipment is necessary.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-610, filed 1/21/86; Order 74-26, § 296-155-610, filed 5/7/74, effective 6/6/74.]

#### WAC 296-155-615 Material handling equipment.

(1) Earthmoving equipment; general.

(a) These rules apply to the following types of earthmoving equipment: Scrapers, loaders, crawler or wheel tractors, bulldozers, off-highway trucks, graders, agricultural and industrial tractors, and similar equipment. The promulgation of specific rules for compactors and rubber-tired "skid-steer" equipment is reserved pending consideration of standards currently being developed.

(b) Seat belts.

(i) Seat belts shall be provided on all equipment covered by this section and shall meet the requirements of the Society of Automotive Engineers, J386-1969, Seat Belts for Construction Equipment. Seat belts for agricultural and light industrial tractors shall meet the seat belt requirements of Society of Automotive Engineers J333a-1970, Operator Protection for Agricultural and Light Industrial Tractors.

(ii) Seat belts need not be provided for equipment which is designed only for standup operation.

(iii) Seat belts shall not be provided for equipment which does not have rollover protective structure (ROPS) or adequate canopy protection.

(c) Access roadways and grades.

(i) No employer shall move or cause to be moved construction equipment or vehicles upon any access roadway or grade unless the access roadway or grade is constructed and maintained to accommodate safely the movement of the equipment and vehicles involved.

(ii) Every emergency access ramp and berm used by an employer shall be constructed to restrain and control runaway vehicles.

(d) Brakes. All earthmoving equipment mentioned in WAC 296-155-615 (1)(a) shall have a service braking system capable of stopping and holding the equipment fully loaded, as specified in Society of Automotive Engineers SAE-J237, Loader Dozer-1971, J236, Graders-1971, and J319b, Scrapers-1971. Brake systems for self-propelled rubber-tired off-highway equipment manufactured after January 1, 1972 shall meet the applicable minimum performance criteria set forth in the following Society of Automotive Engineers Recommended Practices:

Self-propelled scrapers	SAE J319b-1971
Self-propelled graders	SAE J236-1971
Trucks and wagons	SAE J166-1971
Front end loaders and dozers	SAE J237-1971

(e) Fenders. Pneumatic-tired earthmoving haulage equipment (trucks, scrapers, tractors, and trailing units) whose maximum speed exceeds 15 miles per hour, shall be equipped with fenders on all wheels to meet the requirements of Society of Automotive Engineers SAE J321a-1970, Fenders for Pneumatic-Tired Earthmoving Haulage Equipment. An employer may, of course, at any time seek to show under WAC 296-155-010, that the uncovered wheels present no hazard to personnel from flying materials.

(f) Rollover protective structures (ROPS). See Part V of this chapter for requirements for rollover protective structures and overhead protection.

(g) Rollover protective structures for off-highway trucks. The promulgation of standards for rollover protective structures for off-highway trucks is reserved pending further study and development.

(h) Specific effective dates—Brakes and fenders.

(i) Equipment mentioned in WAC 296-155-615 (d) and (e) and manufactured after January 1, 1972, which is used by any employer after that date, shall comply with the applicable rules prescribed therein concerning brakes. Equipment mentioned in WAC 296-155-615 (d) and (e) and manufactured before January 1, 1972, which is used by any employer after that date, shall meet the applicable rules prescribed herein not later than October 1, 1974. It should be noted that employers may request variations from the applicable brakes standards required by this part. Employers wishing to seek variations from the applicable brakes rules may submit any requests for variations in accordance with WAC 296-155-010. Any statements should specify how the

variation would protect the safety of the employees by providing for any compensating restrictions on the operation of equipment.

(i) Audible alarms.

(i) All bidirectional machines, such as rollers, compactors, front-end loaders, bulldozers, and similar equipment, shall be equipped with a horn, distinguishable from the surrounding noise level, which shall be operated as needed when the machine is moving in either direction. The horn shall be maintained in an operative condition.

(ii) No employer shall permit earthmoving or compacting equipment which has an obstructed view to the rear to be used in reverse gear unless the equipment has in operation a reverse signal alarm distinguishable from the surrounding noise level or an employee signals that it is safe to do so.

(iii) In circumstances where the surrounding noise level is of such amplitude that reverse signal alarms are not effective, amber strobe lights shall be used.

(iv) Operators of equipment which does not have an obstructed view to the rear shall look to the rear while operating the equipment in reverse.

(j) Scissor points. Scissor points on all front-end loaders, which constitute a hazard to the operator during normal operation, shall be guarded.

(k) Tractor motors shall be cranked only by operators or other experienced persons.

(l) Waterproof and comfortable seat cushions shall be provided on tractors at all times when working.

(m) Riders, except mechanics and persons in training to operate equipment, shall not be allowed on equipment unless a seat with a seatbelt is provided and used.

(n) Winch lines shall be maintained in good condition and provided with spliced eye, knob or hook in working end, except under conditions where unspliced end is required.

(o) No repairs on blade or dozer equipment shall be initiated unless motor has been stopped and dozer blade is resting on the ground or securely blocked. The same shall apply to carry-all gates.

(p) Bulldozer blades and carryall gates shall rest on the ground or on blocking when machines are not in operation.

(q) Operator shall not leave controls of tractor with master clutch engaged.

(r) Personnel shall not get on or off machine while machine is in motion.

(s) Where excessive dust conditions are created, such areas shall be sprinkled with water to maintain dust at a minimum.

(t) Respirators shall be worn by operators when subjected to harmful dust exposure.

(2) Excavating and other equipment.

(a) Tractors covered in subsection (1) of this section shall have seat belts as required for the operators when seated in the normal seating arrangement for tractor operation, even though backhoes, breakers, or other similar attachments are used on these machines for excavating or other work.

(b) For the purposes of this part and of part L of this chapter, the nomenclatures and descriptions for measurement of dimensions of machinery and attachments shall be as described in Society of Automotive Engineers 1970 Handbook, pages 1088 through 1103.

(c) The safety requirements, ratios, or limitations applicable to machines or attachment usage covered in Power Crane and Shovel Association's Standards No. 1 and No. 2 of 1968, and No. 3 of 1969, shall be complied with, and shall apply to cranes, machines, and attachments under this part.

(3) Lifting and hauling equipment (other than equipment covered under Part L of this chapter).

(a) Industrial trucks shall meet the requirements of WAC 296-155-605 and the following:

(i) Lift trucks, stackers, etc., shall have the rated capacity clearly posted on the vehicle so as to be clearly visible to the operator. When auxiliary removable counter-weights are provided by the manufacturer, corresponding alternate rated capacities also shall be clearly shown on the vehicle. These ratings shall not be exceeded.

(ii) No modifications or additions which affect the capacity or safe operation of the equipment shall be made without the manufacturer's or professional engineer's written approval. If such modifications or changes are made, the capacity, operation, and maintenance instruction plates, tags, or decals, shall be changed accordingly. In no case shall the original safety factor of the equipment be reduced.

(iii) If a load is lifted by two or more trucks working in unison, the proportion of the total load carried by any one truck shall not exceed its capacity.

(iv) Steering or spinner knobs shall not be attached to the steering wheel unless the steering mechanism is of a type that prevents road reactions from causing the steering handwheel to spin. The steering knob shall be mounted within the periphery of the wheel.

(v) All high lift rider industrial trucks shall be equipped with overhead guards which meet the configuration and structural requirements as defined in paragraph 502 of American National Standards Institute B56.1-1975, Safety Standards for Powered Industrial Trucks.

(vi) All industrial trucks in use shall meet the applicable requirements of design, construction, stability, inspection, testing, maintenance, and operation, as defined in American National Standards Institute B56.1-1975, Safety Standards for Powered Industrial Trucks.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-615, filed 1/21/86; Order 74-26, § 296-155-615, filed 5/7/74, effective 6/6/74.]

#### **WAC 296-155-617 Servicing multipiece and single-piece rim wheels.**

[Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-617, filed 1/21/86.]

**WAC 296-155-61701 Scope.** (1) Application. This section applies to the servicing of multipiece and single-piece rim wheels used on large vehicles such as trucks,



tractors, trailers, buses and off-road machines. It does not apply to the servicing of rim wheels used on automobiles, or on pickup trucks and vans utilizing automobile tires or truck tires designated "LT."

(2) All provisions of this section apply to the servicing of both single-piece rim wheels and multipiece rim wheels unless designated otherwise.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-61701, filed 1/21/86.]

**WAC 296-155-61703 Definitions.** (1) "Barrier" means a fence, wall or other structure or object placed between a single-piece rim wheel and an employee during tire inflation, to contain the rim wheel components in the event of the sudden release of the contained air of the single-piece rim wheel.

(2) "Charts" means the United States Department of Transportation, National Highway Traffic Safety Administration (NHTSA) publications entitled *Safety Precautions for Mounting and Demounting Tube-Type Truck/Bus Tires and Multipiece Rim Wheel Matching Chart*, or any other publications such as rim manuals containing, at a minimum, the same instructions, safety precautions and other information contained on those charts that are applicable to the types of rim wheels being serviced.

(3) "Installing a rim wheel" means the transfer and attachment of an assembled rim wheel onto a vehicle axle hub. "Removing" means the opposite of installing.

(4) "Mounting a tire" means the assembly or putting together of the wheel and tire components to form a rim wheel, including inflation. "Demounting" means the opposite of mounting.

(5) "Multipiece rim wheel" means the assemblage of a multipiece wheel with the tire tube and other components.

(6) "Multipiece wheel" means a vehicle wheel consisting of two or more parts, one of which is a side or locking ring designed to hold the tire on the wheel by interlocking components when the tire is inflated.

(7) "Restraining device" means an apparatus such as a cage, rack, assemblage of bars and other components that will constrain all rim wheel components during an explosive separation of a multipiece rim wheel, or during the sudden release of the contained air of a single-piece rim wheel.

(8) "Rim manual" means a publication containing instructions from the manufacturer or other qualified organization for correct mounting, demounting, maintenance, and safety precautions peculiar to the type of wheel being serviced.

(9) "Rim wheel" means an assemblage of tire, tube and liner (where appropriate), and wheel components.

(10) "Service" or "servicing" means the mounting and demounting of rim wheels, and related activities such as inflating, deflating, installing, removing, and handling.

(11) "Service area" means that part of an employer's premises used for the servicing of rim wheels, or any other place where an employee services rim wheels.

(12) "Single-piece rim wheel" means the assemblage of single-piece rim wheel with the tire and other components.

(13) "Single-piece wheel" means a vehicle wheel consisting of one part, designed to hold the tire on the wheel when the tire is inflated.

(14) "Trajectory" means any potential path or route that a rim wheel component may travel during an explosive separation, or the sudden release of the pressurized air, or an area at which an airblast from a single-piece rim wheel may be released. The trajectory may deviate from paths which are perpendicular to the assembled position of the rim wheel at the time of separation or explosion. (See Appendix A for examples of trajectories.)

(15) "Wheel" means that portion of a rim wheel which provides the method of attachment of the assembly to the axle of a vehicle and also provides the means to contain the inflated portion of the assembly (i.e., the tire and/or tube).

[Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-61703, filed 1/21/86.]

**WAC 296-155-61705 Employee training.** (1) Employer responsibility. The employer shall provide a program to train all employees who service rim wheels in the hazards involved in servicing those multipiece rim wheels and the safety procedures to be followed.

(a) The employer shall assure that no employee services any rim wheel unless the employee has been trained and instructed in correct procedures of servicing the type of wheel being serviced, and in the safe operating procedures described in WAC 296-24-21711.

(b) Information to be used in the training program shall include, at a minimum, the applicable data contained in the charts (rim manuals) and the contents of this standard.

(c) Where an employer knows or has reason to believe that any of his employees is unable to read and understand the charts or rim manual, the employer shall assure that the employee is instructed concerning the contents of the charts and rim manual in a manner which the employee is able to understand.

(2) Employee qualification. The employer shall assure that each employee demonstrates and maintains the ability to service rim wheels safely, including performance of the following tasks:

(a) Demounting of tires (including deflation);

(b) Inspection and identification of the rim wheel components;

(c) Mounting of tires (including inflation with a restraining device or other safeguard required by this section);

(d) Use of the restraining device or barrier, and other equipment required by this section;

(e) Handling of rim wheels;

(f) Inflation of the tire when a single-piece rim wheel is mounted on a vehicle;

(g) An understanding of the necessity of standing outside the trajectory both during inflation of the tire

and during inspection of the rim wheel following inflation; and

(h) Installation and removal of wheels.

(3) Ongoing training. The employer shall evaluate each employee's ability to perform these tasks and to service rim wheels safely and shall provide additional training as necessary to assure that each employee maintains his or her proficiency.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-61705, filed 1/21/86.]

**WAC 296-155-61707 Tire servicing equipment. (1) Restraining device - Multipiece.** The employer shall furnish a restraining device for inflating tires on multipiece wheels.

(2) Restraining device - Single-piece. The employer shall provide a restraining device or barrier for inflating tires on single-piece wheels unless the rim wheel will be bolted onto a vehicle during inflation.

(3) Restraining device requirements. Restraining devices and barriers shall comply with the following requirements:

(a) Each restraining device or barrier shall have the capacity to withstand the maximum force that would be transferred to it during a rim wheel separation occurring at one hundred fifty percent of maximum tire specification pressure for the type of rim wheel being serviced;

(b) Restraining devices and barriers shall be capable of preventing rim components from being thrown outside or beyond the device or barrier for any rim wheel position within or behind the device;

(c) Restraining devices and barriers shall be visually inspected prior to each day's use and after any separation of the rim wheel components or sudden release of contained air. Any restraining device or barrier exhibiting damage such as the following defects shall be immediately removed from service:

(i) Cracks at welds;

(ii) Cracked or broken components;

(iii) Bent or sprung components caused by mishandling, abuse, tire explosion or rim wheel separation;

(iv) Pitting of components due to excessive corrosion; or

(v) Other structural damage which would decrease its effectiveness.

(d) Restraining devices removed from service shall not be returned to service until they are repaired and re-inspected. Restraining devices or barriers requiring structural repair such as component replacement or rewelding shall not be returned to service until they are certified either by the manufacturer or by a registered professional engineer as meeting the strength requirements of subsection (3)(a) of this section.

(4) Air line assembly. The employer shall furnish and assure that an air line assembly consisting of the following components be used for inflating tires:

(a) A clip-on chuck;

(b) An in-line valve with a pressure gauge or a presettable regulator; and

(c) A sufficient length of hose between the clip-on chuck and the in-line valve (if one is used) to allow the employee to stand outside the trajectory.

(5) Rim manuals. Current charts (rim manuals) containing instructions for the types of wheels being serviced shall be available in the service area.

(6) Rim manual availability. A current rim manual containing instructions for the type of rims being serviced shall be available in the service area.

(7) Recommended servicing tools. The employer shall furnish and assure that only tools recommended in the rim manual for the type of wheel being serviced are used to service rim wheels.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-61707, filed 1/21/86.]

**WAC 296-155-61709 Wheel component acceptability. (1) Interchange of components.** Multipiece wheel components shall not be interchanged except as provided in the charts, or in the applicable rim manual.

(2) Inspection of components. Multipiece wheel components and single-piece wheels shall be inspected prior to assembly. Any wheel or wheel component which is bent out of shape, pitted from corrosion, broken or cracked shall not be used and shall be marked or tagged unserviceable and removed from the service area. Damaged or leaky valves shall be replaced.

(3) Condition of components. Rim flanges, rim gutters, rings, bead seating surfaces and the bead areas of tires shall be free of any dirt, surface rust, scale or loose or flaked rubber build-up prior to mounting and inflation.

(4) Compatibility check. The size (bead diameter and tire/wheel widths) and type of both the tire and the wheel shall be checked for compatibility prior to assembly of the rim wheel.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-61709, filed 1/21/86.]

**WAC 296-155-61711 Safe operating procedure-- Multipiece rim wheels.** The employer shall establish a safe operating procedure for servicing multipiece rim wheels and shall assure that employees are instructed in and follow that procedure. The procedure shall include at least the following elements:

(1) Deflation before demounting. Tires shall be completely deflated before demounting by removal of the valve core.

(2) Deflation on axle. Tires shall be completely deflated by removing the valve core, before a rim wheel is removed from the axle in either of the following situations:

(a) When the tire has been driven underinflated at eighty percent or less of its recommended pressure; or

(b) When there is obvious or suspected damage to the tire or wheel components.

(3) Rubber lubricant. Rubber lubricant shall be applied to bead and rim mating surfaces during assembly of the wheel and inflation of the tire, unless the tire or wheel manufacturer recommends against it.

(4) Inflation of tire while on vehicle. If a tire on a vehicle is underinflated but has more than eighty percent of the recommended pressure, the tire may be inflated while the rim wheel is on the vehicle provided remote control inflation equipment is used, and no employees remain in the trajectory during inflation.

(5) Tire bead. Tires shall be inflated outside a restraining device only to a pressure sufficient to force the tire bead onto the rim ledge and create an airtight seal with the tire and bead.

(6) Restraining device clearance. Whenever a rim wheel is in a restraining device the employee shall not rest or lean any part of his body or equipment on or against the restraining device.

(7) Inspection of components. After tire inflation, the tire and wheel components shall be inspected while still within the restraining device to make sure that they are properly seated and locked. If further adjustment to the tire or wheel components is necessary, the tire shall be deflated by removal of the valve core before the adjustment is made.

(8) Use of force. No attempt shall be made to correct the seating of side and lock rings by hammering, striking or forcing the components while the tire is pressurized.

(9) Damaged components. Cracked, broken, bent, or otherwise damaged rim components shall not be reworked, welded, brazed, or otherwise heated.

(10) Trajectory clearance. Whenever multipiece rim wheels are being handled, employees shall stay out of the trajectory unless the employer can demonstrate that performance of the servicing makes the employee's presence in the trajectory necessary.

(11) Wheel heating prohibition. No heat shall be applied to a multi-piece wheel or wheel component.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-61711, filed 1/21/86.]

**WAC 296-155-61713 Safe operating procedure—Single-piece rim wheels.** The employer shall establish a safe operating procedure for servicing single-piece rim wheels and shall assure that employees are instructed in and follow that procedure. The procedure shall include at least the following elements:

(1) Deflation. Tires shall be completely deflated by removal of the valve core before demounting.

(2) Mounting and demounting. Mounting and demounting of the tire shall be done only from the narrow ledge side of the wheel. Care shall be taken to avoid damaging the tire beads while mounting tires on wheels.

Tires shall be mounted only on compatible wheels of matching bead diameter and width.

(3) Lubricant. Nonflammable rubber lubricant shall be applied to bead and wheel mating surfaces before assembly of the rim wheel, unless the tire or wheel manufacturer recommends against the use of any rubber lubricant.

(4) Changing machine. If a tire changing machine is used, the tire shall be inflated only to the minimum pressure necessary to force the tire bead onto the rim ledge while on the tire changing machine.

(5) Bead expander. If a bead expander is used, it shall be removed before the valve core is installed and as soon as the rim wheel becomes airtight (the tire bead slips onto the bead seat).

(6) Inflation restrictions. Tires may be inflated only when contained within a restraining device, positioned behind a barrier or bolted on the vehicle with the lug nuts fully tightened.

(7) Inflation trajectory. Tires shall not be inflated when any flat, solid surface is in the trajectory and within one foot of the sidewall.

(8) Employee safety. Employees shall stay out of the trajectory when inflating a tire.

(9) Inflation pressure. Tires shall not be inflated to more than the inflation pressure stamped in the sidewall unless a higher pressure is recommended by the manufacturer.

(10) Seating tire bead. Tires shall not be inflated above the maximum pressure recommended by the manufacturer to seat the tire bead firmly against the rim flange.

(11) Prohibition on use of heat. No heat shall be applied to a single-piece wheel.

(12) Mixing tire and rim sizes. Employee shall be informed of the hazard created by mixing 16" and 16.5" tires and rims.

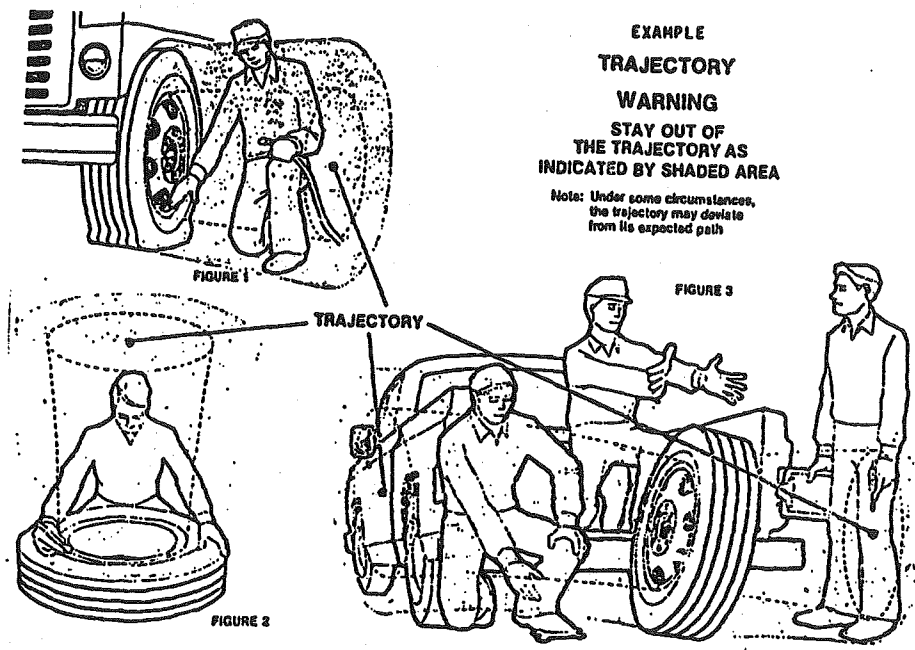
(13) Defective components. Cracked, broken, bent, or otherwise damaged wheels shall not be reworked, welded, brazed, or otherwise heated.

APPENDIX A  
TRAJECTORY

WARNING

STAY OUT OF  
THE TRAJECTORY AS  
INDICATED BY SHADED AREA

Note: Under some circumstances, the trajectory may deviate from its expected path.



**Appendix B—Ordering Information for NHTSA charts**

The NHTSA charts as part of a continuing campaign to alert rim wheel serving personnel of the industry accepted procedures for servicing multipiece rim wheels.

Prints of the charts are available through the Division of Industrial Safety and Health Administration (WISHA) area offices. The address and telephone number of the nearest WISHA area office can be obtained by contacting the State of Washington, Department of Labor and Industries, Division of Industrial Safety and Health, P.O. Box 207, Olympia, Washington, 98504, (206) 754-1258, or in your telephone directory for a local number.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-61713, filed 1/21/86.]

**WAC 296-155-620 Pile driving equipment. (1) General requirements.**

(a) Boilers and piping systems which are a part of, or used with, pile driving equipment shall meet the applicable requirements of the American Society of Mechanical Engineers, Powers Boilers (section I).

(b) All pressure vessels which are a part of or used with, pile driving equipment shall meet the applicable requirements of the American Society of Mechanical Engineers, Pressure Vessels (section VIII).

(c) Overhead protection, which will not obscure the vision of the operator, and which meets the requirements of Part L of this chapter, shall be provided. Protection shall be of 2-inch planking or other solid material of equivalent strength.

(d) Stop blocks shall be provided for the leads to prevent the hammer from being raised against the head block.

(e) A blocking device, capable of safely supporting the weight of the hammer shall be provided for placement in the leads under the hammer at all times while employees are working under the hammer.

(f) Guards shall be provided across the top of the head block to prevent the cable from jumping out of the sheaves.

(g) When the leads must be inclined in the driving of batter piles, provisions shall be made to stabilize the leads.

(h) All working equipment shall be visually inspected at the beginning of each shift.

(i) Fixed leads shall be provided with ladder, and adequate rings, or similar attachment points, so that the loft worker may engage his safety belt lanyard to the leads. If the leads are provided with loft platform(s) such platform(s) shall be protected by standard guardrails.

(j) Pile drivers with swinging leads shall have a wire rope safety strap on top end.

(k) Spud bars shall be of hard wood with smooth round handle end for safe handling. Iron shod spud bars are prohibited.

(l) A follower block or driving cap shall be used with a drop hammer on all piling except sheet piling.

(m) Steam hose leading to a steam hammer or jet pipe shall be securely attached to the hammer with an adequate length of at least 1/4-inch diameter chain or cable to prevent whipping in the event the joint at the hammer is broken. Air hammer hoses shall be provided with the same protection as required for steam lines.

(n) Safety chains, or equivalent means, shall be provided for each hose connection to prevent the line from thrashing around in case the coupling becomes disconnected.

(o) Steam line controls shall consist of two shutoff valves, one of which shall be a quick-acting lever type within easy reach of the hammer operator.

(p) Guys, outriggers, thrustouts, or counterbalances shall be provided as necessary to maintain stability of pile driver rigs.

(q) Ladders constructed in compliance with this chapter shall be installed on all pile drivers from the hoist platform to the head block, and in such position that workers using ladders will not come in contact with lines, sheaves, etc.

(r) Drop hammers which have been chipped on the face shall not be used for pile driving.

(s) Groove worn drums or spools shall be replaced or properly repaired to present a smooth working surface.

(t) At least two full wraps of cable shall be maintained on hoisting drums.

(u) Proper racks shall be provided for storage of cross-cut saws.

(v) Every hoisting drum used as a pile driver shall be equipped with manually operated dogs or pawls to hold suspended loads. Foot brakes shall only be used to hold suspended loads until drum dogs are engaged. The dogs shall be visible from the operator's station or be equipped with a positive direct connected telltale which shall be visible to the operator.

(w) No counterweight or spring arrangement on dogs shall be permitted which would allow dog to be automatically disengaged either by relieving the load or rolling the drum.

(x) In every crew there shall be designated signalmen. The driver operator or drum person shall receive signals from no others, except when loftman is above. The hammer shall not be lowered except on the loftman's signal.

(y) Spliced hammer lines shall not be used.

(2) Pile driving from barges and floats. Barges or floats supporting pile driving operations shall meet the applicable requirements of WAC 296-155-630.

(3) Pile driving equipment.

(a) Engineers and winchmen shall accept signals only from the designated signalmen.

(b) All employees shall be kept clear when piling is being hoisted into the leads.

(c) When piles are being driven in an excavated pit, the walls of the pit shall be sloped to the angle of repose or sheet-piled and braced.

(d) When steel tube piles are being "blown out," employees shall be kept well beyond the range of falling materials.

(e) When it is necessary to cut off the tops of driven piles, pile driving operations shall be suspended except where the cutting operations are located at least twice the length of the longest pile from the driver.

(f) When driving jacked piles, all access pits shall be provided with ladders and bulkheaded curbs to prevent material from falling into the pit.

(g) Floating equipment such as dredges and pile drivers shall maintain a signal system to shore in the event of an emergency.

(h) The distribution of machinery on floating equipment shall be such that the completed unit floats on an even keel.

(i) Fuel tanks below decks shall be vented to outside of hull and vents shall be equipped with flame arrestors.

(j) All hull compartments shall be ventilated. No person shall work in hull compartments until it is shown the compartments contain no flammable or toxic concentrations.

(k) Light fixtures installed or used within the hull shall be explosion proof.

(l) All floating rigs shall be equipped with ladderways extending from the deck to the waterline where the deck is more than 36 inches above the water. A wire rope shall be hung along both sides of the hull or float and so hung that it shall be at all times near or at the waterline.

(m) Doors of deck houses where deck house sets within 36" of edge of deck and doorways in hull shall be equipped with guard rails or cross chains.

(n) Deck houses shall have a substantial grab rail installed on all sides where such installation will not interfere with operations.

(o) Pile driver and dredge fairlead sheaves, and spudline sheaves shall be guarded to prevent workers or tools being drawn into them.

(p) All work deck shall be kept clear of debris, unnecessary tools and equipment in order to minimize the stumbling hazard. Lines shall be coiled, tools stored and material stacked clear of working spaces.

(q) Night operations shall be adequately lighted for all activity while work is in progress and shall be maintained until workers leave the work area.

(r) Electrical installation and equipment shall be installed and maintained in compliance with the National Electric Code.

(s) All walkways over water and on dredge pontoon discharge pipe lines shall be a minimum of 20" in width with standard handrail along one side on structures and gang planks. Walkways on pontoon lines may be equipped with hand lines in lieu of standard handrail.

(t) Adequate fire extinguishing equipment shall be provided and maintained in a serviceable condition.

(u) Protective equipment shall be used when working with creosote timbers. Protective creams shall be used on exposed skin surfaces and gloves and eye protection worn especially when driving piles.

(v) Pulling piles with hammer or pile line rigged through the head block is prohibited unless driver and rigging are designed to safely withstand the imposed strain.

(w) Truck runways and platforms shall be equipped with a wheel guard on all outside edges. Top of wheel guards shall be a minimum of 10 inches above deck.

(x) Use of foot blocks at base of leads for hammer line or pile line is prohibited.

[Order 76-29, § 296-155-620, filed 9/30/76; Order 74-26, § 296-155-620, filed 5/7/74, effective 6/6/74.]

#### WAC 296-155-625 Site clearing. (1) General.

(a) The word "clearing" means the removal of trees, stumps, logs, brush, debris and rubbish from the surface

of the ground in preparation of a site for construction work of any kind. The removal of trees and logs shall be in accordance with the requirements of chapter 296-54 WAC.

(b) All equipment and tools such as axes, sledges, wedges, saws, springboards, etc., shall be maintained in a safe condition and guarded with standard safeguards.

(c) Fallers shall give warning to brushing crews, buckers and other persons in the vicinity where a tree is being felled; taking notice that such persons are not only out of the reach of tree, but also out of danger of possible sidewinders, snags or other trees which may be knocked over by the tree being felled.

(d) No tree shall be felled toward and within range of traveled road or railroad in use, unless a flagman is placed on such road or railroad to warn all approaching persons or to stop vehicles.

(e) Clearing crews shall not be placed immediately below other crews working on hillsides where there is a possible danger of skidding or rolling trees, moving earth or rock.

(f) Pioneer roads on clearing operations shall be constructed to safely accommodate all equipment moved over road.

(g) Hazardous standing and down timber, rocks, etc., shall be moved from upper sides of cuts on side hill operations.

(h) Care shall be exercised in the use of oil for burning brush or timber.

(i) Employees engaged in site clearing shall be protected from hazards of irritant and toxic plants and suitably instructed in the first aid treatment available.

(j) All equipment used in site clearing operations shall be equipped with rollover guards meeting the requirements of this chapter. In addition, rider-operated equipment shall be equipped with an overhead and rear canopy guard meeting the following requirements:

(i) The overhead covering on this canopy structure shall be of not less than 1/8-inch steel plate or 1/4-inch woven wire mesh with openings no greater than 1 inch, or equivalent.

(ii) The opening in the rear of the canopy structure shall be covered with not less than 1/4-inch woven wire mesh with openings no greater than 1 inch.

(k) In addition to observance of the general safety and health standards;

(i) The employer shall assume the responsibility of work assignment so that no worker shall be required to work in a position or location so isolated that he is not within ordinary calling distance of another person who can render assistance in case of emergency. In any operation where cutting, felling trees, loading, or a combination of these duties is carried on, there shall be a minimum crew of two persons who shall work as a team and shall be in visual or voice contact with one another. If one worker at these operations is required to be left alone for a period of time, he shall be contacted by another person at reasonable intervals not to exceed fifteen minutes unless such practice can be established to be impractical.

(ii) This does not apply to operators of motor vehicles, watchmen or certain other jobs which, by their nature, are singular worker assignments. However, a definite procedure for checking the welfare of all workers during working hours shall be instituted and all workers so advised.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-625, filed 1/21/86; Order 74-26, § 296-155-625, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-630 Marine operations and equipment.** (1) Material handling operations.

(a) Operations fitting the definition of "material handling" shall be performed in conformance with applicable requirements of "Safety and health regulations for longshoring." The term "longshoring operations" means the loading, unloading, moving, or handling of construction materials, equipment and supplies, etc. into, in, on, or out of any vessel, from a fixed structure or shore-to-vessel, vessel-to-shore or fixed structure or vessel-to-vessel.

(2) Access to barges.

(a) Ramps for access of vehicles to or between barges shall be of adequate strength, provided with side boards, well maintained, and properly secured.

(b) Unless employees can step safely to or from the wharf, float, barge, or river towboat, either a ramp, meeting the requirements of (a) of this subsection, or a safe walkway, shall be provided.

(c) Jacob's ladders shall be of the double rung or flat tread type. They shall be well maintained and properly secured.

(d) A Jacob's ladder shall either hang without slack from its lashings or be pulled up entirely.

(e) When the upper end of the means of access rests on or is flush with the top of the bulwark, substantial steps, properly secured and equipped with at least one substantial hand rail approximately 33 inches in height, shall be provided between the top of the bulwark and the deck.

(f) Obstructions shall not be laid on or across the gangway.

(g) The means of access shall be adequately illuminated for its full length.

(h) Unless the structure makes it impossible, the means of access shall be so located that the load will not pass over employees.

(3) Working surfaces of barges.

(a) Employees shall not be permitted to walk along the sides of covered lighters or barges with coamings more than 5 feet high, unless there is a 3-foot clear walkway, or a grab rail, or a taut handline is provided.

(b) Decks and other working surfaces shall be maintained in a safe condition.

(c) Employees shall not be permitted to pass fore and aft, over, or around deckloads, unless there is a safe passage.

(d) Employees shall not be permitted to walk over deckloads from rail to coaming unless there is a safe passage. If it is necessary to stand at the outboard or inboard edge of the deckload where less than 24 inches of

bulwark, rail, coaming, or other protection exists, all employees shall be provided with a suitable means of protection against falling from the deckload.

(4) First-aid and lifesaving equipment.

(a) Provisions for rendering first aid and medical assistance shall be in accordance with Part B of this Chapter.

(b) The employer shall ensure that there is in the vicinity of each barge in use at least one U.S. Coast Guard-approved 30-inch life ring with not less than 90 feet of line attached, and at least one portable or permanent ladder which will reach the top of the apron to the surface of the water. If the above equipment is not available at the pier, the employer shall furnish it during the time that he is working the barge.

(c) Employees walking or working on the unguarded decks of barges shall be protected with U.S. Coast Guard-approved personal flotation devices such as Type I PFD, Type II PFD, Type III PFD, or Type V PFD, or their equivalent, pursuant to 46 CFR 160 (Coast Guard Lifesaving Equipment Specifications) and 33 CFR 175.23 (Coast Guard table of devices equivalent to personal flotation devices). Ski belt or inflatable type personal flotation devices are specifically prohibited.

(5) Diving operations. (Reserved.)

[Order 76-29, § 296-155-630, filed 9/30/76; Order 74-26, § 296-155-630, filed 5/7/74, effective 6/6/74.]

## Part N

### EXCAVATION, TRENCHING, AND SHORING

#### WAC

296-155-650	Definitions applicable to this part.
296-155-655	General protection requirements.
296-155-65505	Sewage piping system.
296-155-660	Specific excavation requirements.
296-155-66005	Borrow pits.
296-155-665	Specific trenching requirements.
296-155-66501	Table N-1.
296-155-66502	Table N-2.
296-155-66503	Table N-3.
296-155-66504	Table N-4.
296-155-66505	Table N-5.

**WAC 296-155-650 Definitions applicable to this part.** (1) "Accepted engineering requirements (or practices)" means those requirements or practices which are compatible with standards required by a registered architect, a registered professional engineer, or other duly licensed or recognized authority.

(2) "Angle of repose" means the greatest angle above the horizontal plane at which a material will lie without sliding or rolling.

(3) "Bank" means a mass of soil rising above a digging level.

(4) "Belled excavation" means a part of a shaft or footing excavation, usually near the bottom and bell-shaped; i.e., an enlargement of the cross section above.

(5) "Borrow pit" means a cavity or opening formed in the earth by breaking, loosening, cutting, digging or pushing aside material and removal of any unprocessed earthen material.

(6) "Braces (trench)" means the horizontal members of the shoring system whose ends bear against the uprights or stringers.

(7) "Cofferdam" means a watertight chamber used to exclude water or other fluid or semi-fluid material during excavation for foundations and the construction of subsurface structures.

(8) "Compact shale" means a type of hardened clay that has not yet split into thin layers.

(9) "Competent person" means one who is capable of identifying hazards in the surroundings or working conditions which are unsanitary, hazardous or dangerous.

(10) "Equipment" means ladders, scaffolds, ramps, runways, railings, barricades, sheet piling, shoring, bracing and any such safeguards, protective construction and devices used in affording protection to the workers engaged in excavating work.

(11) "Embankment" means an artificial or man-made bank of earthen material.

(12) "Excavation" means any manmade cavity or depression in the earth's surface, including its sides, walls, or faces, formed by earth removal and producing unsupported earth conditions by reasons of the excavation. If installed forms or similar structures reduce the depth-to-width relationship, an excavation may become a trench.

(13) "Faces" see subsection (21) of this section.

(14) "Hard compact soil" means all earth materials not classified as running or unstable.

(15) "Kickouts" means accidental release or failure of a shore or brace.

(16) "Moving ground" means any ground, which for any reason, will not remain in its original location.

(17) "Ramp" means an inclined runway.

(18) "Runway" means any planked-over walkway or drive constructed and maintained as a passageway for workers or rolling equipment.

(19) "Sheet pile" means a pile, or sheeting, that may form one of a continuous interlocking line, or a row of timber, concrete, or steel piles, driven in close contact to provide a tight wall to resist the lateral pressure of water, adjacent earth, or other materials.

(20) "Shoring system" means any assembly of equipment or material used to prevent the ground or earth from moving.

(21) "Sides," "walls," or "faces" means the vertical or inclined earth surfaces formed as a result of excavation work.

(22) "Slope" means the angle with the horizontal at which a particular earth material will stand indefinitely without movement.

(23) "Stringers" (wales) means the horizontal members of a shoring system whose sides bear against the uprights or earth.

(24) "Structural construction" means any activity or process required in the actual construction of any type of structure, pipeline or conduit exclusive of the excavation.

(25) "Trench" means a narrow excavation made below the surface of the ground. In general, the depth is greater than the width, but the width of a trench is not greater than 15 feet.



(26) "Trench jack" means screw or hydraulic type jacks used as cross bracing in a trench shoring system.

(27) "Trench shield" or "trench box" means a shoring system composed of steel plates and bracing, welded or bolted together, which support the walls of a trench from the ground level to the trench bottom and which can be moved along as work progresses.

(28) "Unstable soil" means earth material, other than running that because of its nature or the influence of related conditions, cannot be depended upon to remain in place without extra support, such as would be furnished by a system of shoring.

(29) "Uprights" means the vertical members of a shoring system.

(30) "Wales" see subsection (23) of this section.

(31) "Walls" see subsection (21) of this section.

[Statutory Authority: RCW 49.17.040 and 49.17.050, 86-03-074 (Order 86-14), § 296-155-650, filed 1/21/86. Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240, 81-13-053 (Order 81-9), § 296-155-650, filed 6/17/81; Order 74-26, § 296-155-650, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-655 General protection requirements.** (1) This part on "excavation work" and "trenching" is intended to provide protection of all employees during all excavation or trenching in connection with all construction work, such as trenches, excavations, underpinning, shoring and bracing, and in connection with the construction of footings, foundations, retaining walls and other construction work below ground level.

(2)(a) Underground utilities. Prior to opening an excavation or trench, efforts shall be made to determine whether underground installations of utilities will be encountered. If so, the appropriate utility company shall be notified and requested to identify the exact location of the underground installation.

(i) Proper supports and precautions shall be provided for existing installations.

(ii) When electric lines are of the direct burial type, a qualified person shall make positive identification of the cable.

(iii) Mechanical excavating equipment shall maintain a two foot clearance from the direct burial cable.

(b) Power line clearance. No equipment, motor vehicle, tool, or individual shall operate within 10 feet of any power line or electrical distribution equipment except in conformity with the requirements of WAC 296-155-525 (2)(e).

(3) Surface encumbrances. Trees, boulders, utility poles, and other surface encumbrances, located so as to create a hazard to employees involved in excavation or trenching work or in the vicinity thereof at any time during operations, shall be removed or made safe before excavating or trenching is begun or continued.

(4) Wall and face guarding. The walls and faces of all excavations or trenches in which employees are exposed to danger from moving ground, falling rocks, sloughing, or sliding earth shall be guarded by:

(a) A shoring system.

(b) Sloping of the ground, or some other equivalent means.

(c) Sloping of the ground or the shoring system shall extend to the bottom of the trench or excavation.

(5) Trench and excavation protection. Except in solid rock and compact shale, the sides of all trenches and excavations, including embankments, four feet or more in depth shall be shored, sheeted, braced, sloped, or otherwise supported by means of sufficient strength to protect employees. (See Tables N-1, N-2, N-3, N-4 and N-5.)

(6) Protection for trenches less than four feet. Trenches less than four feet in depth shall also be effectively protected when there are indications that hazardous ground movement is possible.

(7) Inspection. Excavations and trenches shall be inspected by a competent person after every rainstorm or other hazard-increasing occurrence. The protection against slides and cave-ins shall be increased if necessary.

(8) Top person. No person shall be allowed to work in a trench over four feet in depth unless there is a top person in constant attendance. The top person shall be in addition to the equipment operator when the person in the trench is not in constant view of the equipment operator.

(9) Slope encumbrances. The surface of the slope of any trench or excavation shall be cleaned of boulders, stumps, or other hard masses of earth in the form of chunks, that could roll or slide into the trench or excavation endangering persons below.

(10) Evaluation of protection requirements. The determination of the angle of slope or design of the supporting system, or both, shall be based on careful evaluation of pertinent factors such as:

(a) Depth of cut.

(b) Possible variation in water content of the material while the trench or excavation is open.

(c) Anticipated changes in materials from exposure to air, sun, water, or freezing.

(d) Loading imposed by structures, equipment, overlying material, or stored material.

(e) Vibration from equipment, blasting, traffic or other sources.

(11) Supporting system requirements. Supporting systems, i.e., piling, cribbing, shoring, etc., shall be designed by a qualified person and meet accepted engineering requirements.

(a) When tie rods are used to restrain the top of sheeting or other retaining systems, the rods shall be securely anchored well back of the angle of slope.

(b) When tight sheeting or sheet piling is used, full loading due to ground water table shall be assumed, unless prevented by weep holes or drains or other means.

(c) Additional stringers, ties, and bracing shall be provided to allow for any necessary temporary removal of individual supports.

(d) Excavation and lagging done in conjunction with soldier piles shall be completed in not more than eight foot lifts.

(12) Required angle of slope.

(a) All slopes shall be excavated to at least the angle illustrated in Tables N-1, N-3, and N-4 for the type of

soil encountered, except for solid rock or compact shale which require no sloping under normal conditions.

(b) The angle of slope shall be flattened to the next required category when an excavation or trench is exposed to:

- (i) Excessive water conditions;
- (ii) Silty materials;
- (iii) Loose boulders;

(iv) Areas where erosion, deep frost action, or slide planes appear.

(13) Storage of excavated material.

(a) In excavations or trenches which employees are required to enter, excavated or other material shall be stored and retained at least two feet or more away from the edge of the excavation or trench.

(b) Barriers or other effective retaining devices may be used to prevent excavated or other material from falling or rolling into the excavation or trench.

(14) Condition of protection materials. Materials used for sheeting, sheet piling, cribbing, bracing, shoring, and underpinning shall be in good serviceable condition, and timbers shall be sound, free of large or loose knots, and of proper dimensions in accordance with Table N-5.

(15) Temporary sheet piling. Temporary sheet piling which has been installed to permit the construction of a retaining wall shall not be removed until such retaining wall has acquired its full strength.

(16) Surface water control. Diversion ditches, dikes, or other suitable means shall be used to prevent surface water from entering an excavation or trench and to provide adequate drainage of the area adjacent to the excavation or trench. If necessary, pumps shall be used to minimize water from accumulating in the excavation or trench.

(17) Additional protection for excavations when equipment is nearby. If it is necessary to place or operate power shovels, backhoes, derricks, cranes, trucks, materials, or other heavy objects on a level above and closer laterally than the depth of the trench or excavation, the sides of the excavation or trench shall be sheet-piled, shored, or braced as necessary to resist the additional pressure due to such superimposed loads.

(18) Stop logs. When mobile equipment is utilized or allowed adjacent to excavations or trenches, substantial stop logs or barricades shall be installed, except that such equipment shall not be required for the equipment doing the actual excavating or backfilling operation.

(19) Physical barrier protection.

(a) Adequate physical barrier protection shall be provided at all remotely located excavations or trenches.

(b) All wells, pits, shafts, etc., shall be barricaded or covered.

(c) Upon completion of exploration and similar operations, temporary wells, pits, shafts, etc., shall be completely backfilled.

(20) Dust control. Dust conditions shall be minimized by the use of water, salt, calcium, oil, or other effective means.

(21) Air quality.

(a) In locations where an oxygen deficient atmosphere or gaseous conditions are possible, air in the excavation or trench shall be tested before entering.

(b) Controls as set forth in Part B and C of this chapter, shall be established to assure acceptable atmospheric conditions.

(c) When flammable gases are present, adequate ventilation shall be provided and sources of ignition shall be eliminated.

(d) Attended emergency rescue equipment, such as breathing apparatus, a safety harness with lifeline, basket stretcher, etc., shall be readily available where adverse atmospheric conditions may exist or develop in an excavation or trench.

(i) During such conditions a competent top person shall be in constant attendance.

(ii) It shall be the employer's responsibility to ensure that such top person has been thoroughly trained in emergency rescue procedures and that voice or visual contact shall be maintained with the person in the excavation or trench at all times until the hazardous condition no longer exists.

(22) Walkway and bridge requirements. Where employees or equipment cross over excavations or trenches, walkways or bridges with standard guardrails shall be provided. Such walkways or bridges shall be designed and constructed by qualified persons in accordance with accepted engineering requirements and practices.

(23) Ladders. All ladders used in excavations and trenches shall be in accordance with the requirements of Part J of this chapter.

(24) Backfilling. When excavations or trenches are made in locations adjacent to backfilled excavations or trenches. Additional precautions by way of shoring and bracing shall be taken to prevent slides or cave-ins.

(25) Ledge rock scaling. Excavations or trenches made in ledge rock or compact shale shall not require bracing or shoring but shall be inspected by a competent representative of the employer before each shift of work, at which time all loose, shattered, or disintegrated rock shall be removed from sides and face of excavation or trench.

(26) Report weakness in shoring. Workers shall be instructed to immediately report any signs or indications of weakness of shoring or bracing in excavations or trenches.

(27) Safety equipment inspection. Any safety device or equipment needed in connection with excavation work or trenching shall be inspected, erected, and maintained in a safe condition for the duration of the operation.

(28) State and federal safety codes. Federal and state safety codes, rules, regulations and ordinances governing any and all phases of excavation work and trenching shall be observed at all times.

(29) Sidewalk clearance and shoring. Walkways, runways, and sidewalks shall be kept clear of excavated material or other obstructions and no sidewalks shall be undermined unless shored to carry a minimum live load of one hundred twenty-five pounds per square foot.

(30) Plank walkways. If planks are used for raised walkways, runways, or sidewalks.

(a) They shall be laid parallel to the length of the walk and fastened together against displacement.

(b) The planks shall be uniform in thickness and all exposed ends shall be provided with beveled cleats to prevent tripping.

(c) The planks shall have a safety factor of four times the intended loading.

(31) Raised walkways. Raised walkways, runways, and sidewalks shall be provided with plank steps on strong stringers. Ramps, used in lieu of steps, shall be provided with cleats to insure a safe walking surface.

(32) Personal protection. All employees shall be protected with personal protective equipment for the protection of head, eyes, respiratory organs, hands, feet, and other parts of the body as set forth in Part C of this chapter.

(33) Employees exposed to vehicles. Employees exposed to moving vehicles shall wear hard hats and warning vests of high visibility material, reflectorized at night. The requirements of WAC 296-155-300 through 296-155-315 apply.

(34) Protection from overhead hazards. No person shall be permitted under loads handled by power shovels, backhoes, draglines, derricks, hoists, or front end loaders. To avoid injury from spillage, employees, including the driver unless protected adequately by the cab, shall be required to stand away from any vehicle being loaded.

(35) Inspection. Inspections of excavations and trenches shall be made prior to each work shift by a competent person. If evidence of possible cave-ins or slides is apparent, all work in the excavation or trench shall cease until precautions have been taken to safeguard the employees.

(36) Excavation and trench exits. When employees are required to be in excavations or trenches four feet deep or more, an adequate means of exit, such as a ladder or steps, shall be provided and located so as to require no more than twenty-five feet of lateral travel. An earth ramp is acceptable providing:

(a) The stability of the earth is adequate for good footing.

(b) The total travel distance does not exceed twenty-five feet.

(c) The trench depth does not exceed fifteen feet.

(d) Adequate shoring or equivalent protection is provided for the entire escape route.

(37) Water main safeguards. When existing loop water mains are running laterally within two feet of the excavation or trench wall the valve the greatest distance from the work site shall be closed.

(a) The exact location of the open valve and the valve key shall be given to the workers before they enter the excavation or trench.

(b) The open valve location shall be marked and clear access to the valve maintained.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-655, filed 1/21/86. Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-13-053 (Order 81-9), § 296-155-655, filed 6/17/81; Order 76-29, § 296-155-655, filed 9/30/76; Order 74-26, § 296-155-655, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-65505 Sewage piping system.** (1) On sewage piping systems newly constructed (not yet in service) or those under construction, the following requirements meet the intent of chapter 296-62 WAC concerning confined space and ventilation.

(a) Internal combustion engines other than mobile diesel shall not be used. When mobile diesel powered equipment is used, the requirements of WAC 296-155-730(3) shall be complied with.

(b) A positive induced air flow that provides 200 C.F.M. at the work location.

(c) Prior to entry, a minimum of five air changes where oxygen deficiency may exist.

(d) Ten air changes where toxic or flammable material may be present.

(2) In confined spaces or limited egress situations there shall always be an observer or tie off person.

(3) For any person traveling through on a sled or working in small diameter pipe, the requirements listed below apply.

(a) Ventilation of the pipe run prior to entry.

(b) Radio communication link or use of lights for signaling.

(c) Positive means of retrieval.

Note: To make the air changes in subsection (1) of this section more practical to implement, it should be noted that inflatable blanks can be inserted on either side of the entered manhole just beyond the next manhole. In effect, where the activity is performed will be ventilated, but not necessarily the entire pipe length. When movement through the pipe is required, the required changes can be calculated based on the total run.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-65505, filed 1/21/86.]

**WAC 296-155-660 Specific excavation requirements.** (1) Side, slope and face maintenance. Sides, slopes, and faces of all excavations shall meet accepted engineering requirements by scaling, benching, barricading, rock bolting, wire meshing, or other equally effective means. Special attention shall be given to slopes which may be adversely affected by weather or moisture content.

(2) Special precautions for previously backfilled excavations. Special precautions shall be taken in sloping or shoring the sides of excavations adjacent to a previously backfilled excavation or a fill, particularly when the separation is less than the depth of the excavation. Particular attention shall also be given to joints and seams of material comprising a face, and the slope of such seams and joints.

(3) Work adjacent to excavations. Where workers are employed adjacent to an excavation on work other than that directly involving the excavation, protection such as standard guardrails or other equivalent protection to prevent their falling into the excavation shall be provided for such workers.

(4) Excavation below foundation. Except in solid rock, excavations below the level of the base of footing of any foundation or retaining wall, shall not be permitted, unless the wall is underpinned and all other precautions taken to insure the stability of the adjacent walls for the

protection of employees involved in the excavation work or in the vicinity.

(5) Buildings adjacent to excavations. If the stability of adjoining buildings or walls is endangered by excavations, shoring, bracing, or underpinning shall be provided. Such shoring, bracing, or underpinning shall be inspected daily or more often, as conditions warrant. The inspections shall be made by a competent person and the protection effectively maintained.

(6) Ramps and runways.

(a) Ramps or runways used for vehicles shall be of a width of not less than four feet wider than the vehicle used and shall be provided with:

(i) Timber guards not less than eight inches by eight inches, placed parallel to and secured to the sides of the runway or ramp.

(ii) Berms on earthen ramps.

(iii) Other equivalent protection.

(b) All ramps and runways shall receive frequent inspection, and shall be maintained in a safe and serviceable condition.

(c) Workers shall stay off ramps and runways when trucks are passing over them.

(d) When ramps and runways are formed on hard ground without the use of planking, all ruts and holes shall be filled in, humps leveled off and the runway or ramp made smooth.

(7) Blasting and the use of explosives shall be performed in accordance with chapter 296-52 WAC, Safety standards for the possession, handling and use of explosives.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-660, filed 1/21/86. Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-13-053 (Order 81-9), § 296-155-660, filed 6/17/81; Order 76-29, § 296-155-660, filed 9/30/76; Order 74-26, § 296-155-660, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-66005 Borrow pits.** (1) When excavating equipment is used to remove earthen material from borrow pits.

(a) The pit walls shall be maintained in a condition to reduce the possibility of the walls sliding or caving in where employees could be exposed to the danger of moving ground.

(b) The pit walls shall be maintained at a height no greater than the maximum reach of the excavating machine.

(c) Employees on foot shall not be permitted to be in close proximity to the pit walls.

(d) Pit walls shall not be undermined.

(e) Wall control.

(i) The safe control of borrow pit walls, including the overall slope of the walls, shall be consistent with:

(A) Recognized engineering standards;

(B) The nature of the ground and the kind of material being excavated.

(ii) Excavation methods shall be selected which will ensure wall and bank stability including benching as necessary to obtain a safe overall slope in accordance with Table N-1.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-66005, filed 1/21/86.]

**WAC 296-155-665 Specific trenching requirements.**

(1) Trenches in excess of twenty feet deep. Support systems shall be planned and designed by a qualified person when trenches are to be in excess of twenty feet in depth, adjacent to structures or improvements, or subject to excessive vibration or ground water.

(2) Angle of repose requirements. When sloping to the angle of repose does not extend to the bottom of the trench, shoring shall be required to support the vertical part of the trench. The shoring shall extend above the bottom of the slope a minimum of twelve inches to prevent material from sliding or rolling into the trench. (See Table N-3.)

(3) Trenches for pipe six feet or larger in diameter. In compacted angular gravels or glacial till type soil, when the outside diameter of the pipe to be laid is six feet or larger, the sides of the trench can be vertical at the bottom four feet of the trench, providing a four foot bench is provided immediately above the vertical portion, and the remaining portion of the trench above the bench is sloped to the angle of repose. (See Table N-4.)

(4) Mechanical diggers. When a mechanical digger is used, the bracing or shoring shall be placed as close as possible to the lower end of the boom. (See subsection (12) of this section.)

(5) Undercut trenches. When trenches are undercut, they shall be shored and braced to safely support the overhanging material.

(6) Voids. If for any reason prior to, during, or subsequent to the placement of the trench shoring or bracing system, voids should form in the sides or face of the trench, such voids shall be promptly filled with compacted material or blocking, as required, to distribute the load uniformly onto the shoring or bracing system.

(7) Trenches adjacent to structures. If a trench is cut alongside an existing structure and the footings of the structure are nearer to the trench than the plane of repose for the soil, they shall be underpinned or the side wall of the trench rigidly supported.

(8) Bell-bottomed pier holes.

(a) Employees entering bell-bottomed pier holes shall be protected by the installation of a removable-type casing of sufficient strength to resist shifting of the surrounding earth. Such temporary protection shall be provided for the full depth of that part of each pier hole which is above the bell.

(b) A means of emergency egress shall be decided prior to personnel entering bell-bottom pier holes. Employees expected to enter bell-bottom pier holes shall be instructed as to the hazards of their respective duties, and in the means of emergency egress.

Note: Example of protection: A lifeline, suitable for instant rescue and securely fastened to a shoulder harness, shall be worn by each employee entering the shaft or pier hole. This lifeline shall be individually manned and separate from any line used to remove materials excavated from the bell footing.

(9)(a) Trench shoring and bracing specifications. Minimum requirements for trench shoring or bracing shall be in accordance with Tables N-2 and N-5.

(b) Braces and diagonal shores in a wood shoring system shall not be subjected to compressive stress in excess of values given by the following formula:

$$S = 1300 - \frac{20L}{D}$$

$$\text{Maximum ratio } \frac{L}{D} = 50$$

Where:

- L = Length, unsupported, in inches.
- D = Least side of the timber in inches.
- S = Allowable stress in pounds per square inch of cross-section.

(10) Cross braces. Cross braces or trench jacks shall be placed in true horizontal position, be spaced vertically, and be secured to prevent sliding, falling or kickouts.

(11) Trench boxes. Portable trench boxes or sliding trench shields may be used for the protection of personnel in lieu of a shoring system or sloping. Where such trench boxes or shields are used, they shall be designed, constructed, and maintained in a manner which will provide protection equal to or greater than sheeting or shoring.

(12) Backfilling. Backfilling and removal of trench supports shall progress together from the bottom of the trench. Jacks or braces shall be released slowly. Ropes shall be used to pull out the jacks or braces from above after employees have cleared the trench.

(13) Signalpersons. Signalpersons shall be employed to direct equipment when backfilling.

(14) Temporary shoring. The construction of temporary shoring work shall be done, or supervised, by a competent person, who shall make frequent inspections and issue instructions for its removal.

(15) Trenching machines (ladder and rotary type).

(a) Trenching machine operators shall not get on or off the machine while in operation.

(b) Workers shall not work at sloping the top of ditch near the bucket line.

(c) Excavated material shall be conveyed to a pile not closer than two feet of the edge of the trench.

(d) Trucks hauling excavated material away from a trenching machine shall not approach closer to the edge of trench laterally than the trench depth.

(e) Where side cutters are installed, it is mandatory that persons stay clear of the bucket line.

(16) Blasting and the use of explosives shall be performed in accordance with chapter 296-52 WAC, Safety standards for the possession, handling and use of explosives.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-665, filed 1/21/86; 85-10-004 (Order 85-09), § 296-155-665, filed 4/19/85. Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-13-053 (Order 81-9), § 296-155-665, filed 6/17/81; Order 77-12, § 296-155-665, filed 7/11/77; Order 76-29, § 296-155-665, filed 9/30/76; Order 74-26, § 296-155-665, filed 5/7/74, effective 6/6/74.]

WAC 296-155-66501 Table N-1.

Well Rounded Loose Sand 2 - 1 (25:34)	Compact Sharp Sand 1 1/2 - 1 (33:41)	Recommended Slope for Average Soils 1 - 1 (45)	Compact Angular Gravel-sand (3:1) 1/2 - 1 (63:76)	Solid Rock & Compact Shale (90)
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Note: Clays, Silts, Layers of Non-homogeneous Soils Require Shoring and Bracing.  
The Presence of Ground Water Requires Special Treatment.

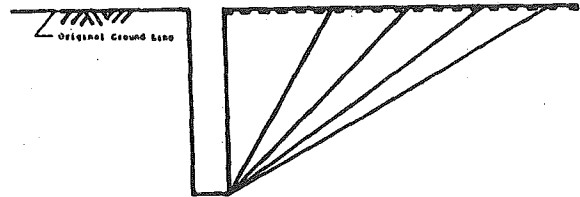


TABLE N-1

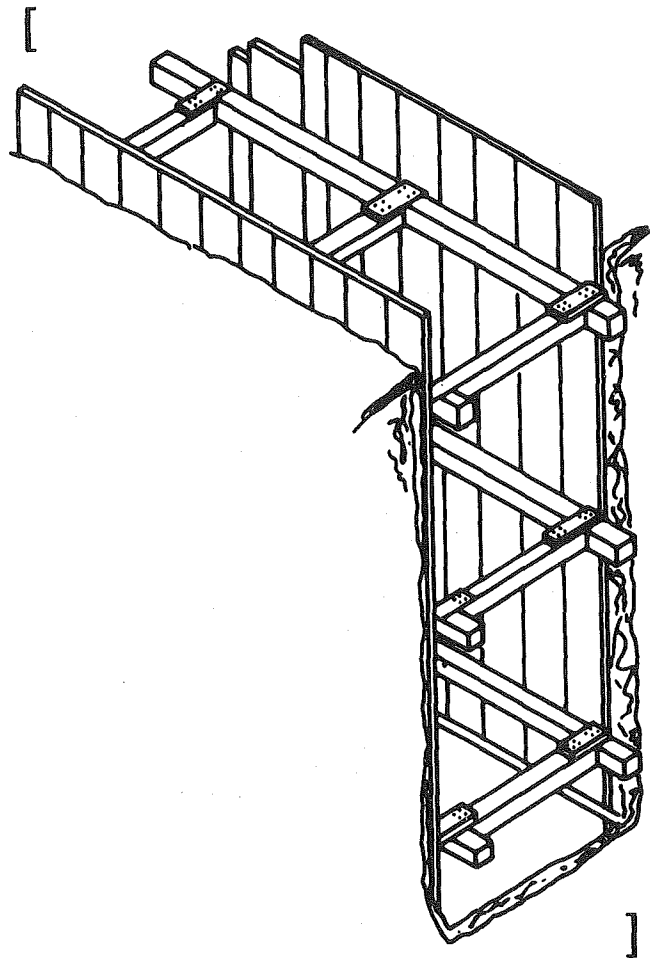
Minimum required degrees of slope for different types of soil encountered for excavations and trenches.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-66501, filed 1/21/86; 82-13-045 (Order 82-22), § 296-155-66501, filed 6/11/82; Order 76-29, Table N-1 (codified as WAC 296-155-66501), filed 9/30/76; Order 74-26, § 296-155-665 (part), Table N-1, filed 5/7/74, effective 6/6/74.]

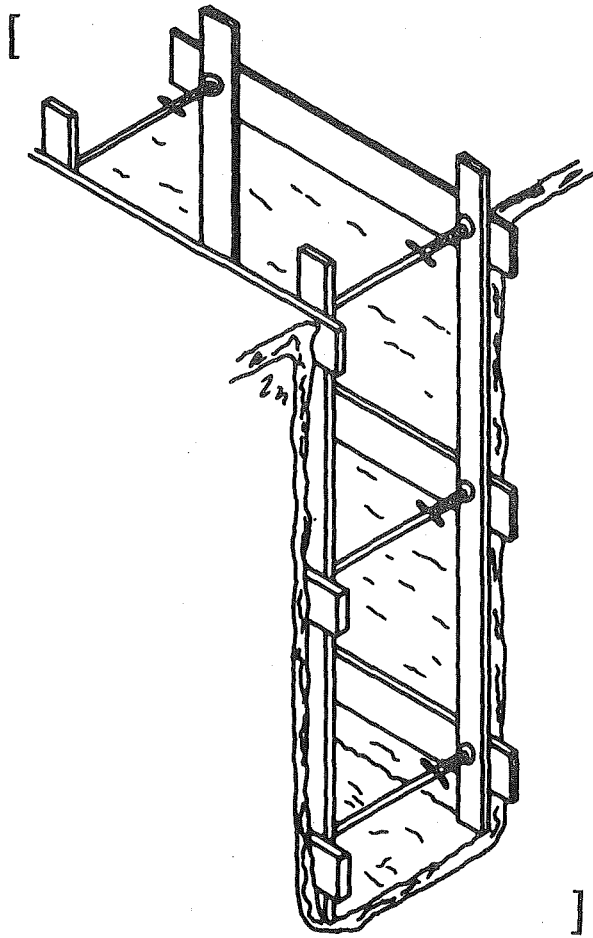
WAC 296-155-66502 Table N-2.

TABLE N-2

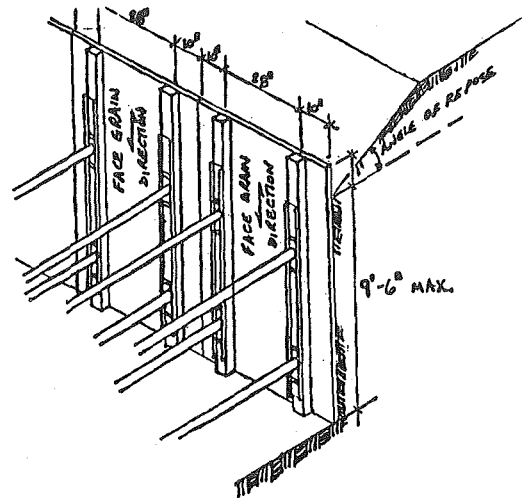
TYPICAL SHORING EXAMPLES



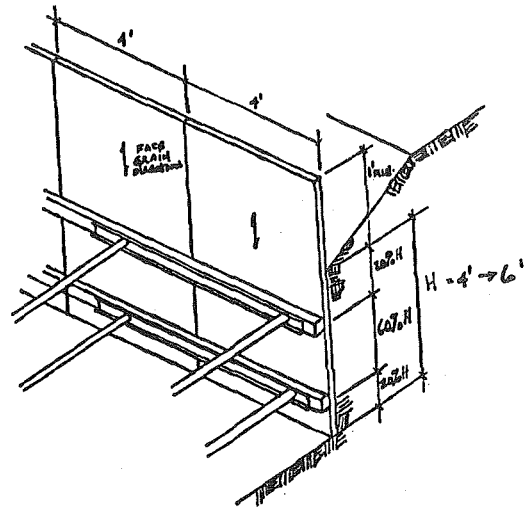
[Tight sheeting soft soil]



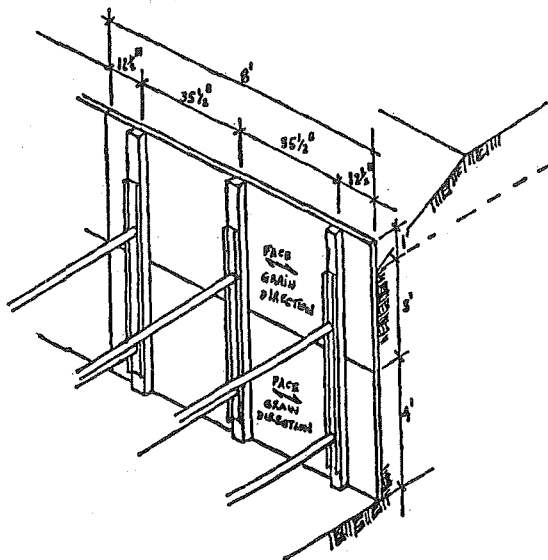
[Trench shoring hard soil]



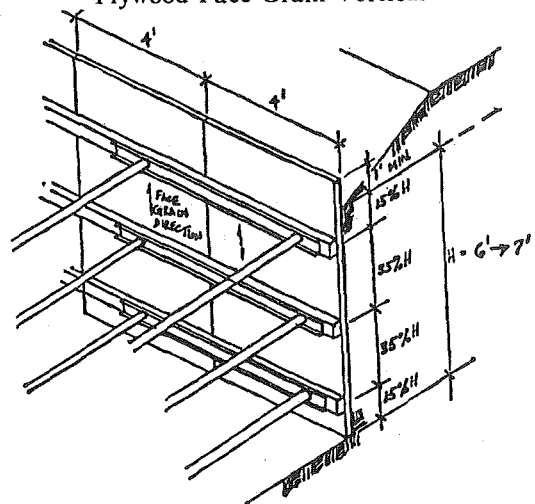
Plywood Supports Vertical  
Plywood Face Grain Vertical



Plywood Supports Horizontal  
Plywood Face Grain Vertical



Plywood Supports Vertical  
Plywood Face Grain Horizontal



Plywood Supports Horizontal  
Plywood Face Grain Horizontal

Plywood shall have a minimum thickness of 1-1/8 inches and be APA rated Sturd-I-Floor, 48 o.c. 2-4-1 grade, or equivalent.

Example: For a 5 foot trench, the horizontal cross bracing shall be placed 20% or 1 foot from the top and bottom of the trench leaving 60% or 3 feet between the cross braces.

[Statutory Authority: RCW 49.17.040 and 49.17.050, 86-03-074 (Order 86-14), § 296-155-66502, filed 1/21/86; Order 76-29, Table N-2 (codified as WAC 296-155-66502), filed 9/30/76; Order 74-26, § 296-155-665 (part), Table N-2, filed 5/7/74, effective 6/6/74.]

Reviser's note: RCW 34.05.395 requires the use of underlining and deletion marks to indicate amendments to existing rules, and deems ineffectual changes not filed by the agency in this manner. The bracketed material in the above section does not appear to conform to the statutory requirement.

WAC 296-155-66503 Table N-3.

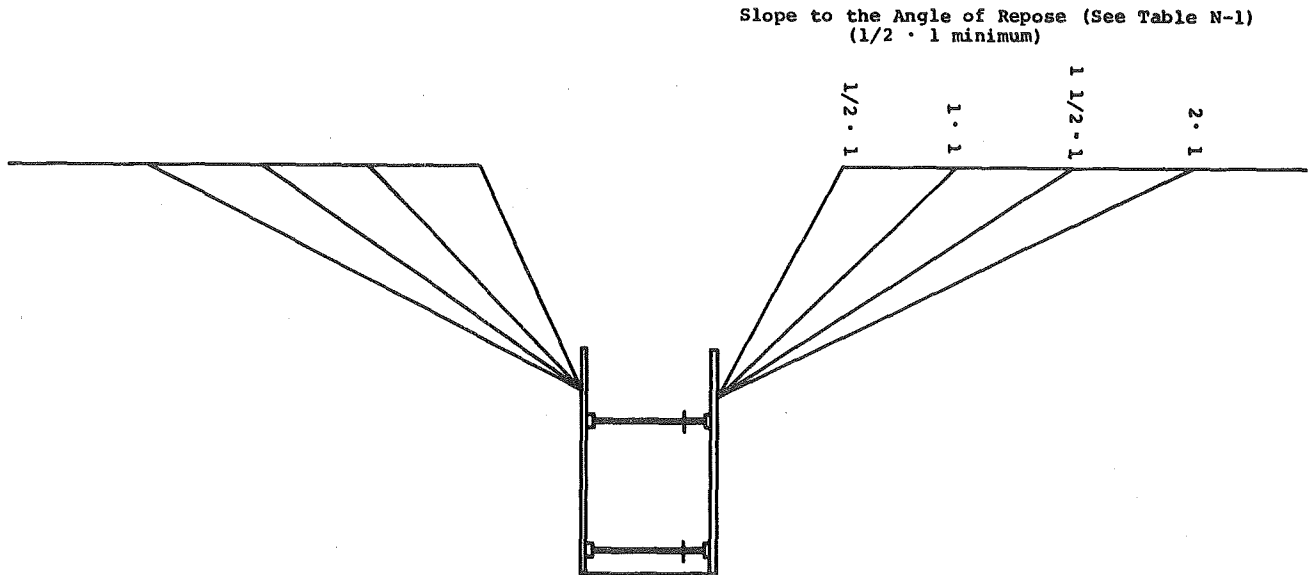


TABLE N-3

EXAMPLE: COMBINATION SHORING AND SLOPING

[Order 76-29, Table N-3 (codified as WAC 296-155-66503), filed 9/30/76; Order 74-26, § 296-155-665 (part), Table N-3, filed 5/7/74, effective 6/6/74.]

WAC 296-155-66504 Table N-4.

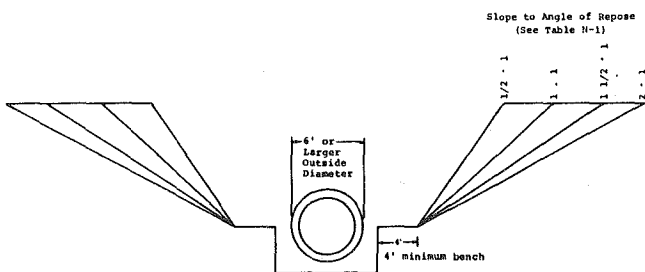


TABLE N-4

BENCHING PROVISIONS FOR LAYING PIPE OF 6 FOOT OUTSIDE DIAMETER OR LARGER

[Order 76-29, Table N-4 (codified as WAC 296-155-66504), filed 9/30/76; Order 74-26, § 296-155-665 (part), Table N-4, filed 5/7/74, effective 6/6/74.]

WAC 296-155-66505 Table N-5.

TABLE N-5

EXCAVATION AND TRENCH SHORING MINIMUM REQUIREMENTS

TABLE N-5--PART I

Depth of trench or excavation & Kind or condition of earth	Size and spacing of members			
	Uprights		Stringers	
	Minimum dimension	Maximum spacing	Min. dim.	Max. sp.
Feet	Inches	Feet	In.	Ft.
4 to 10				
Hard, compact	3x4 or 2x6	6		
Likely to crack	3x4 or 2x6	3	4x6	4
		Close		
Soft, sandy, or filled	3x4 or 2x6	sheeting	4x6	4
		Close		
Hydrostatic pressure	3x4 or 2x6	sheeting	6x8	4



TABLE N-5--PART I

Depth of trench or excavation & Kind or condition of earth	Size and spacing of members			
	Uprights		Stringers	
	Minimum dimension	Maximum spacing	Min. dim.	Max. sp.
Feet	Inches	Feet	In.	Ft.
10 to 15				
Hard	3x4 or 2x6	4	4x6	4
Likely to crack	3x4 or 2x6	2	4x6	4
		Close		
Soft, sandy, or filled	3x4 or 2x6	sheeting	4x6	4
		Close		
Hydrostatic pressure	3x6	sheeting	8x10	4
15 to 20		Close		
All kinds or conditions	3x6	sheeting	4x12	4
Over 20		Close		
All kinds or conditions	3x6	sheeting	6x8	4

TABLE N-5--PART II

Depth of trench or excavation & Kind or condition of earth	Size and spacing of members						
	Cross braces <sup>1</sup>						
	Width of trench					Maximum spacing	
Feet	Up to 3 ft.	3-6 ft.	6-9 ft.	9-12 ft.	12-15 ft.	Vert.	Hori.
	In.	In.	In.	In.	In.	Ft.	Ft.
4 to 10							
Hard, compact	2x6	4x4	4x6	6x6	6x8	4	6
Likely to crack	2x6	4x4	4x6	6x6	6x8	4	6
Soft, sandy, or filled	4x4	4x6	6x6	6x8	8x8	4	6
Hydrostatic pressure	4x4	4x6	6x6	6x8	8x8	4	6
10 to 15							
Hard	4x4	4x6	6x6	6x8	8x8	4	6
Likely to crack	4x4	4x6	6x6	6x8	8x8	4	6
Soft, sandy, or filled	4x6	6x6	6x8	8x8	8x10	4	6
Hydrostatic pressure	4x6	6x6	6x8	8x8	8x10	4	6
15 to 20							
All kinds or conditions	4x12	6x8	8x8	8x10	10x10	4	6
Over 20							
All kinds or conditions	4x12	8x8	8x10	10x10	10x12	4	6

<sup>1</sup>Trench jacks may be used in lieu of, or in combination with, cross braces. Shoring is not necessarily required in solid rock, hard shale, or hard slag. Where desirable, steel sheet piling and bracing of equal strength may be substituted for wood.

Note: In excavations over 15 feet in width, cross bracing shall be designed by a qualified person.

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-13-053 (Order 81-9), § 296-155-66505, filed 6/17/81; Order 76-29, Table N-5 (codified as WAC 296-155-66505), filed 9/30/76; Order 74-26, § 296-155-665 (part), Table N-5, filed 5/7/74, effective 6/6/74.]

Part O

CONCRETE, CONCRETE FORMS AND SHORING

WAC

- 296-155-675 Scope, application, and definitions applicable to this part.
- 296-155-680 General provisions.
- 296-155-681 Safe walking surfaces on concrete structural members.
- 296-155-682 Requirements for equipment and tools.
- 296-155-683 Concrete finishing.
- 296-155-684 Requirements for cast in place concrete.
- 296-155-685 Tubular welded frame shoring.
- 296-155-686 Tube and coupler shoring.
- 296-155-687 Single post shores.
- 296-155-688 Vertical slip forms.
- 296-155-689 Placing and removal of forms.
- 296-155-690 Appendix to WAC 296-155-684 cast in place concrete.
- 296-155-691 Precast concrete and tilt-up operations.
- 296-155-692 Requirements for lift-slab operations.
- 296-155-694 Appendix to WAC 296-155-692 lift-slab operations.
- 296-155-695 Miscellaneous concrete construction.
- 296-155-697 Requirements for masonry construction.
- 296-155-699 Appendix A to Subpart Q—References to Subpart Q of Part 1926.

**WAC 296-155-675 Scope, application, and definitions applicable to this part.** (1) Scope and application. This subpart sets forth requirements to protect all construction employees from the hazards associated with concrete and masonry construction operations performed in workplaces covered under chapter 296-155 WAC.

(2) Definitions applicable to this part.

(a) "Bull float" means a tool used to spread out and smooth the concrete.

(b) "Formwork" means the total system of support for freshly placed or partially cured concrete, including the mold or sheeting (form) that is in contact with the concrete as well as all supporting members including shores, reshores, hardware, braces, and related hardware.

(c) "Limited access zone" means an area alongside a masonry wall, which is under construction, and which is clearly demarcated to limit access by employees.

(d) "Precast concrete" means concrete members (such as walls, panels, slabs, columns, and beams) which have been formed, cast, and cured prior to final placement in a structure.

(e) "Reshoring" means the construction operation in which shoring equipment (also called reshores or reshoring equipment) is placed, as the original forms and shores are removed, in order to support partially cured concrete and construction loads.

(f) "Shore" means a supporting member that resists a compressive force imposed by a load.

(g) "Vertical slip forms" means forms which are jacked vertically during the placement of concrete.

(h) "Guy" means a line that steadies a high piece or structure by pulling against an off-center load.

[Statutory Authority: Chapter 49.17 RCW. 89-11-035 (Order 89-03), § 296-155-675, filed 5/15/89, effective 6/30/89; Order 74-26, § 296-155-675, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-680 General provisions.** (1) General. All equipment, material and construction techniques used in concrete construction and masonry work shall

meet the applicable requirements for design, construction, inspection, testing, maintenance and operations as prescribed in ANSI A10.9-1970, Safety Requirements for Concrete Construction and Masonry Work.

(2) Construction loads. No construction loads shall be placed on a concrete structure or portion of a concrete structure unless the employer determines, based on information received from a person who is qualified in structural design, that the structure or portion of the structure is capable of supporting the loads.

(3) Vertical loads. Vertical loads consist of a dead load plus an allowance for live load. The weight of formwork together with the weight of freshly placed concrete is dead load. The live load consists of the weight of workmen, equipment, runways and impact, and shall be computed in pounds per square foot (psf) of horizontal projection.

(4) Lateral loads. Braces and shores shall be designed to resist all foreseeable lateral loads such as wind, cable tensions, inclined supports, impact of placement, and starting and stopping of equipment. The assumed value of load due to wind, impact of concrete, and equipment acting in any direction at each floor line shall not be less than one hundred pounds per lineal foot of floor edge or two percent of total dead load of the floor, whichever is greater. Wall forms shall be designed for a minimum wind load of ten psf, and bracing for wall forms should be designed for a lateral load of at least one hundred pounds per lineal foot of wall, applied at the top. Walls of unusual height require special consideration.

(5) Special loads. Formwork shall be designed for all special conditions of construction likely to occur, such as unsymmetrical placement of concrete, impact of machine-delivered concrete, uplift, and concentrated loads.

(6) Construction loads. Imposition of any construction loads on the partially completed structure shall not be permitted unless such loading has been considered in the design and approved by the engineer-architect.

(7) Form supports and wedges shall be checked during concrete placement to prevent distortion or failure.

(8) Reinforcing steel.

(a) Employees shall not be permitted to work above vertically protruding reinforcing steel unless it has been protected to eliminate the hazard of impalement.

(b) Wire mesh rolls: Wire mesh rolls shall be secured at each end to prevent dangerous recoiling action.

(c) Guying: Reinforcing steel for walls, piers, columns, and similar vertical structures shall be guyed and supported to prevent overturning and to prevent collapse.

(9) Post-tensioning operations.

(a) No employee (except those essential to the post-tensioning operations) shall be permitted to be behind the jack during tensioning operations.

(b) Signs and barriers shall be erected to limit employee access to the post-tensioning area during tensioning operations.

(10) Working under loads.

(a) No employee shall be permitted to work under concrete buckets while buckets are being elevated or lowered into position.

(b) To the extent practical, elevated concrete buckets shall be routed so that no employee, or the fewest number of employees, are exposed to the hazards associated with falling concrete buckets.

(11) Personal protective equipment.

(a) No employee shall be permitted to apply a cement, sand, and water mixture through a pneumatic hose unless the employee is wearing protective head and face equipment.

(b) No employee shall be permitted to place or tie reinforcing steel more than six feet (1.8 m) above any adjacent working surface unless the employee is protected by the use of a safety belt or equivalent fall protection meeting the criteria of WAC 296-155-225.

[Statutory Authority: Chapter 49.17 RCW. 89-11-035 (Order 89-03), § 296-155-680, filed 5/15/89, effective 6/30/89. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-680, filed 1/21/86; Order 74-26, § 296-155-680, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-681 Safe walking surfaces on concrete structural members.** Structural members with studs, dowels, or shear connectors installed on the top side shall not be used as a walkway and/or means of access unless such studs, dowels, or shear connectors are covered with suitable material and in such a manner as to provide a walking surface at least as stable and free of hazards as the top surface of the member would provide without attachments installed.

Note: For the purpose of this section, "stud" means all protruding metal attachments to structural members.

[Statutory Authority: Chapter 49.17 RCW. 89-11-035 (Order 89-03), § 296-155-681, filed 5/15/89, effective 6/30/89.]

**WAC 296-155-682 Requirements for equipment and tools.** (1) Bulk cement storage. Bulk storage bins, containers, and silos shall be equipped with the following:

(a) Conical or tapered bottoms; and

(b) Mechanical or pneumatic means of starting the flow of material.

(2) No employee shall be permitted to enter storage facilities unless the ejection system has been shut down and locked out in accordance with WAC 296-155-429.

(3) Safety belts, harnesses, lanyards, lifelines or droplines, independently attached or attended, shall be used as prescribed in WAC 296-155-225 (10)(a).

(4) Concrete mixers. Concrete mixers with one cubic yard (.8 m<sup>3</sup>) or larger loading skips shall be equipped with the following:

(a) A mechanical device to clear the skip of materials; and

(b) Guardrails installed on each side of the skip.

(5) Power concrete trowels. Powered and rotating type concrete troweling machines that are manually guided shall be equipped with a control switch that will automatically shut off the power whenever the hands of the operator are removed from the equipment handles.

(6) Concrete buggies. Concrete buggy handles shall not extend beyond the wheels on either side of the buggy.

Note: Installation of knuckle guards on buggy handles is recommended.

(7) Runways shall be constructed to carry the maximum contemplated load with a safety factor of four, have a smooth running surface and be of sufficient width for two buggies to pass. Single runs to have a minimum width of forty-two inches with turnouts. Runways to have standard railings. Where motor driven concrete buggies are used, a minimum four-inches by four-inches wheel guard shall be securely fastened to outside edge of runways.

(8) Concrete pumping systems.

(a) The employer shall comply with the manufacturer's specifications and limitations applicable to the operation of pumpcrete or similar systems. Where manufacturer's specifications are not available, the limitations assigned to the equipment shall be based on the determinations of a qualified engineer, competent in this field, and such determinations will be appropriately documented and recorded.

(b) Rated load capacities, and recommended operating speeds and pressures, special hazard warnings, or instructions, shall be conspicuously posted on all equipment. Instructions and warnings shall be visible to the operator while he is at his control station.

(c) Concrete pumping systems using discharge pipes shall be provided with pipe supports designed for one hundred percent overload.

(d) Compressed air hoses used on concrete pumping systems shall be provided with positive fail-safe joint connectors to prevent separation of sections when pressurized.

(e) No part of the concrete pumping system shall operate closer to high voltage electrical conductors than the distances specified in WAC 296-155-428 (1)(d)(i) and (ii).

(9) Concrete buckets.

(a) Concrete buckets equipped with hydraulic or pneumatic gates shall have positive safety latches or similar safety devices installed to prevent premature or accidental dumping.

(b) Concrete buckets shall be designed to prevent concrete from hanging up on top and the sides.

(c) Riding of concrete buckets for any purpose shall be prohibited, and vibrator crews shall be kept out from under concrete buckets suspended from cranes or cableways.

(d) When discharging on a slope, the wheels of ready-mix trucks shall be blocked and the brakes set to prevent movement.

(10) Tremies. Sections of tremies and similar concrete conveyances shall be secured with wire rope (or equivalent materials in addition to the regular couplings or connections).

(11) Bull floats. Bull float handles, used where they might contact energized electrical conductors, shall be constructed of nonconductive material or insulated with a nonconductive sheath whose electrical and mechanical characteristics provide the equivalent protection of a handle constructed of nonconductive material.

(12) Masonry saws shall be constructed, guarded, and operated in accordance with ANSI A10.9-1983. Safety

requirements for concrete construction and masonry work and in accordance with WAC 296-155-367.

(13) Lockout/tagout procedures. No employee shall be permitted to perform maintenance or repair activity on equipment (such as compressors, mixers, screens, or pumps used for concrete and masonry construction activities) where the inadvertent operation of the equipment could occur and cause injury, unless all potentially hazardous energy sources have been locked out and tagged in accordance with WAC 296-155-429.

[Statutory Authority: Chapter 49.17 RCW. 89-11-035 (Order 89-03), § 296-155-682, filed 5/15/89, effective 6/30/89.]

**WAC 296-155-683 Concrete finishing.** (1) Scaffolding for use of cement finishers shall comply with all applicable subsections of WAC 296-155-485.

(2) Where grinders, chippers, and other equipment is used which creates a thrust force while working on scaffolding, such scaffold shall be securely tied to a structure or held in with weighted drop lines.

(3) Grinding and dressing operations carried on within closed rooms, stairwells, elevator shafts, etc., shall be provided with forced air ventilation.

(4) Grinding machine operators shall wear respirators whenever machines are in operation or where dust hazard exists.

(5) Eye protection shall be worn by workers engaged in grinding, chipping, or sacking concrete as required by WAC 296-155-215.

[Statutory Authority: Chapter 49.17 RCW. 89-11-035 (Order 89-03), § 296-155-683, filed 5/15/89, effective 6/30/89.]

**WAC 296-155-684 Requirements for cast in place concrete.** (1) General requirements for formwork.

(a) Formwork shall be designed, fabricated, erected, supported, braced, and maintained so that it will be capable of supporting without failure all vertical and lateral loads that may reasonably be anticipated to be applied to the formwork. Formwork which is designed, fabricated, erected, supported, braced, and maintained in conformance with the Appendix to this section will be deemed to meet the requirements of this subdivision.

(b) Any form, regardless of size, shall be planned in every particular and designed and constructed with an adequate factor of safety. In addition to computable loading, additional form pressures may result from impact during concrete placement, sudden lowering of temperatures retarding the set and increasing the liquid head or static pressure, vibrations of the form or concrete, uneven stressing resulting from failure or weakening of form members, or impact from concrete buckets or placing equipment. As a result, an adequate factor of safety is required to offset these unpredictable conditions.

(c) The thoroughness of planning and design shall be governed by the size, complexity, and intended use of the form. Formwork which is complex in nature or which will be subjected to unusually high concrete pressures shall be designed or approved for use by an engineer or experienced form designer.

(2) Drawings or plans, including all revisions, for the jack layout, formwork (including shoring equipment), working decks, and scaffolds, shall be available at the jobsite.

(3) Shoring and reshoring.

(a) General: Shoring installations constructed in accordance with this standard shall be designed in accordance with American National Standard Recommended Practice for Concrete Formwork, ANSI-(ACI 347-78), Formwork for Concrete ACI 318-83, or with the following publications of the Scaffolding & Shoring Institute: Recommended Standard Safety Code for Vertical Shoring, 1970; Single Post Shore Safety Rules, 1969; and Steel Frame Shoring Safety, Safety Rules, 1969.

(b) All shoring equipment shall be inspected prior to erection to determine that it is as specified in the shoring layout.

(c) A shoring layout shall be prepared or approved by a person qualified to analyze the loadings and stresses which are induced during the construction process.

(d) A copy of the shoring layout shall be available at the jobsite.

(e) The shoring layout shall include all details of the specification, including unusual conditions such as heavy beams, sloping areas, ramps, and cantilevered slabs, as well as plan and elevation views.

(f) Shoring equipment found to be damaged such that its strength is reduced to less than that required by WAC 296-155-683 (1)(a) shall not be used for shoring.

(g) Erected shoring equipment shall be inspected immediately prior to, during, and immediately after concrete placement.

(h) Upon inspection, shoring equipment that is found to be damaged or weakened shall be immediately removed and replaced.

(i) The sills for shoring shall be sound, rigid, and capable of carrying the maximum intended load without settlement or displacement.

(j) All base plates, shore heads, extension devices, and adjustment screws shall be in firm contact, and secured when necessary, with the foundation and the form.

(k) Eccentric loads on shore heads and similar members shall be prohibited unless these members have been designed for such loading.

(l) The minimum total design load for any shoring used in slab and beam structures shall be not less than one hundred pounds per square foot for the combined live and dead load regardless of slab thickness; however, the minimum allowance for live load and formwork shall be not less than twenty pounds per square foot in addition to the weight of the concrete. Additional allowance for live load shall be added for special conditions other than when placing concrete for standard-type slabs and beams. Shoring shall also be designed to resist all foreseeable lateral loads such as wind, cable tensions, inclined supports, impact of placement, and starting and stopping of equipment. The assumed value of load due to wind, impact of concrete, and equipment acting in any direction at each floor line shall not be less than one

hundred pounds per lineal foot of floor edge or two percent of total dead load of the floor, whichever is greater. (See subsection (3)(b) of this section.)

(m) When motorized carts are used, the design load shall be increased twenty-five pounds per square foot.

(4) The design stresses for form lumber and timbers shall be within the tolerance of the grade, condition, and species of lumber used.

(5) The design stresses used for form lumber and timber shall be shown on all drawings, specifications, and shoring layouts.

(6) All load-carrying timber members of scaffold framing shall be a minimum of 1500 f (stress grade) construction grade lumber. All dimensions are nominal sizes except that where rough sizes are noted, only rough or undressed lumber of the size specified shall satisfy minimum requirements.

(7) When shoring from soil, an engineer or other qualified person shall determine that the soil is adequate to support the loads which are to be placed on it.

(8) Precautions shall be taken so that weather conditions do not change the load-carrying conditions of the soil below the design minimum.

(9) When shoring from fill or when excessive earth disturbance has occurred, an engineer or other qualified person shall supervise the compaction and reworking of the disturbed area and determine that it is capable of carrying the loads which are to be imposed upon it.

(10) Suitable sills shall be used on a pan or grid dome floor or any other floor system involving voids where vertical shoring equipment could concentrate an excessive load on a thin concrete section.

(11) When temporary storage of reinforcing rods, material, or equipment on top of formwork becomes necessary, these areas shall be sufficient to meet the loads.

(12) If any deviation in the shoring plan is necessary because of field conditions, the person who prepared the shoring layout shall be consulted for his approval of the actual field setup before concrete is placed.

(13) The shoring setup shall be checked to insure that all details of the layout have been met.

(14) The completed shoring setup shall be a homogeneous unit or units and shall have the specified bracing to give it lateral stability.

(15) The shoring setup shall be checked to make certain that bracing specified in the shoring layout for lateral stability is in place.

(16) All vertical shoring equipment shall be plumb. Maximum allowable deviation from the vertical is one-eighth inch in three feet. If this tolerance is exceeded, the shoring equipment shall not be used until readjusted within this limit.

(17) Upon inspection, shoring equipment that is found to be damaged or weakened shall be immediately removed and replaced.

(18) Shoring equipment shall not be released or removed until the approval of a qualified engineer has been received.

(19) Removal of shoring equipment shall be planned so that the equipment which is still in place is not overloaded.

(20) Slabs or beams which are to be reshored should be allowed to take their actual permanent deflection before final adjustment of reshoring equipment is made.

(21) While the reshoring is underway, no construction loads shall be permitted on the partially-cured concrete.

(22) The allowable load on the supporting slab shall not be exceeded when reshoring.

(23) The reshoring shall be thoroughly checked to determine that it is properly placed and that it has the load capacity to support the areas that are being reshored.

[Statutory Authority: Chapter 49.17 RCW. 89-11-035 (Order 89-03), § 296-155-684, filed 5/15/89, effective 6/30/89.]

**WAC 296-155-685 Tubular welded frame shoring.**

(1) Metal tubular frames used for shoring shall have allowable loads based on tests conducted according to the Recommended Procedure for Compression Testing of Scaffolds and Shores, Scaffolding & Shoring Institute, 1967.

(2) Design of shoring layouts shall be based on allowable loads which were obtained using the test procedures of subsection (1) of this section and on at least a two and one-half to one safety factor.

(3) All metal frame shoring equipment shall be inspected before erection.

(4) Metal frame shoring equipment and accessories shall not be used if heavily rusted, bent, dented, re-welded, or having broken weldments or other defects.

(5) All locking devices on frames and braces shall be in good working order, coupling pins shall align the frame or panel legs, pivoted cross braces shall have their center pivot in place, and all components shall be in a condition similar to that of original manufacture.

(6) When checking the erected shoring frames with the shoring layout, the spacing between towers and cross-brace spacing shall not exceed that shown on the layout, and all locking devices shall be in the closed position.

(7) Devices for attaching the external lateral stability bracing shall be securely fastened to the legs of the shoring frames.

(8) All baseplates, shore heads, extension devices, or adjustment screws shall be in firm contact with the footing sill and the form material, and shall be snug against the legs of the frames.

(9) Eccentric loads on shore heads and similar members shall be prohibited unless the shore heads have been designed for such loading.

(10) When formwork is installed at an angle, or sloping, or when the surface shored from is sloping, the shoring shall be designed for such loading.

(11) Adjustment screws shall not be adjusted to raise formwork after the concrete is in place.

[Statutory Authority: Chapter 49.17 RCW. 89-11-035 (Order 89-03), § 296-155-685, filed 5/15/89, effective 6/30/89; Order 74-26, § 296-155-685, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-686 Tube and coupler shoring.** (1) Tube and coupler towers used for shoring shall have allowable loads based on tests conducted according to the Recommended Procedure for Compression Testing of Scaffolds and Shores, Scaffolding & Shoring Institute, 1967.

(2) Design of shoring layouts shall be based on working loads which were obtained using the test procedures of subsection (1) of this section and on at least a two and one-half to one safety factor.

(3) All tube and coupler components shall be inspected before being used.

(4) Tubes of shoring structures shall not be used if heavily rusted, bent, dented, or having other defects.

(5) Couplers (clamps) shall not be used if deformed, broken, or having defective or missing threads on bolts, or other defects.

(6) The material used for the couplers (clamps) shall be of a structural type such as drop-forged steel, malleable iron, or structural grade aluminum. Gray cast iron shall not be used.

(7) When checking the erected shoring towers with the shoring layout, the spacing between posts shall not exceed that shown on the layout, and all interlocking of tubular members and tightness of couplers should be checked.

(8) All baseplates, shore heads, extension devices, or adjustment screws shall be in firm contact with the footing sill and the form material, and shall be snug against the posts.

(9) Eccentric loads on shore heads and similar members shall be prohibited unless the shore heads have been designed for such loading.

(10) Special precautions shall be taken when formwork is at angles, or sloping, or when the surface shored from is sloping.

(11) Adjustment screws shall not be adjusted to raise formwork after the concrete is in place.

[Statutory Authority: Chapter 49.17 RCW. 89-11-035 (Order 89-03), § 296-155-686, filed 5/15/89, effective 6/30/89.]

**WAC 296-155-687 Single post shores.** (1) When checking erected single post shores with the shoring layout, the spacing between shores in either direction shall not exceed that shown on the layout, and all clamps, screws, pins, and all other components shall be in the closed or engaged position.

(2) For stability, single post shores shall be horizontally braced in both the longitudinal and transverse directions. Diagonal bracing shall also be installed. Such bracing shall be installed as the shores are being erected.

(3) Devices which attach to the external lateral stability bracing shall be securely fastened to the single post shores.

(4) All baseplates or shore heads of single post shores shall be in firm contact with the footing sill and the form material.

(5) Whenever single post shores are used in more than one tier, the layout shall be designed and inspected by a structural engineer.

(6) Eccentric loads on shore heads shall be prohibited unless the shore heads have been designed for such loading.

(7) When formwork is at an angle, or sloping, or when the surface shored from is sloping, the shoring shall be designed for such loading.

(8) Adjustment of single post shores to raise formwork shall not be made after concrete is in place.

(9) Respecting fabricated single post shores, the following shall apply:

(a) The clamp used for adjustable timber single post shores shall have working load ratings based on tests conducted according to the standard test procedures for fabricated single post shores in Recommended Procedure for Compression Testing of Scaffolds and Shores, Scaffolding & Shoring Institute, 1967, and on at least a three to one safety factor.

(b) Shoring layouts shall be made using working loads which were obtained using the test procedures of (a) of this subsection, and on at least a three to one safety factor.

(c) All fabricated single post shores shall be inspected before being used.

(d) Fabricated single post shores shall not be used if heavily rusted, bent, dented, rewelded, or having broken weldments or other defects. If they contain timber, they shall not be used if timber is split, cut, has sections removed, is rotted, or otherwise structurally damaged.

(e) All clamps, screws, pins, threads, and all other components shall be in a condition similar to that of original manufacture.

(10) Respecting adjustable timber single post shores, the following shall apply:

(a) The clamp used for adjustable timber single post shores shall have working load ratings based on tests conducted according to the standard test procedures for fabricated single post shores in Recommended Procedure for Compression Testing of Scaffolds and Shores, Scaffolding & Shoring Institute, 1967, and on at least a three to one safety factor.

(b) Timber used shall have the safety factor and allowable working load for each grade and species as recommended in the Tables for wooden columns in the Wood Structural Design Data Book, National Forest Products Association, 1970.

(c) The shoring layout shall be made using the allowable load obtained by using the test procedure for the clamp or Tables for timber referred to in (a) and (b) of this subsection.

(d) All timber and adjusting devices to be used for adjustable timber single post shores shall be inspected before erection.

(e) Timber shall not be used if it is split, cut, has sections removed, is rotted, or is otherwise structurally damaged.

(f) Adjusting devices shall not be used if heavily rusted, bent, dented, rewelded, or having broken weldments or other defects.

(g) All nails used to secure bracing on adjustable timber single post shores shall be driven home and the point of the nail bent over.

(11) Respecting timber single post shores, the following shall apply:

(a) Timber used as single post shores shall have the safety factor and allowable working load for each grade and species as recommended in the Tables for wooden columns in the Wood Structural Design Data Book, National Forest Products Association, 1970.

(b) The shoring layout shall be prepared by using working loads obtained by using the Tables referred to in (a) of this subsection.

(c) All timber to be used for single post shoring shall be inspected before erection.

(d) Timber shall not be used if it is split, cut, has sections removed, is rotted, or is otherwise structurally damaged.

(e) All nails used to secure bracing on timber single post shores shall be driven home and the point of the nail bent over.

(12) Tiered single post shores. Whenever single post shores are used one on top of another (tiered), the employer shall comply with the following specific requirements in addition to the general requirements for formwork:

(a) The design of the shoring shall be prepared by a qualified designer and the erected shoring shall be inspected by an engineer qualified in structural design.

(b) The single post shores shall be vertically aligned.

(c) The single post shores shall be spliced to prevent misalignment.

(d) The single post shores shall be adequately braced in two mutually perpendicular directions at the splice level. Each tier shall also be diagonally braced in the same two directions.

(e) Adjustment of single post shores to raise formwork shall not be made after the placement of concrete.

(f) Reshoring shall be erected, as the original forms and shores are removed, whenever the concrete is required to support loads in excess of its capacity.

[Statutory Authority: Chapter 49.17 RCW. 89-11-035 (Order 89-03), § 296-155-687, filed 5/15/89, effective 6/30/89.]

**WAC 296-155-688 Vertical slip forms.** (1) Slip forms shall be designed and constructed, and the form movement carried out, under the immediate supervision of a person or persons experienced in slip form design and operation. Drawings prepared by a qualified engineer, showing the jack layout, formwork, working decks, and scaffolding, shall be available at the jobsite, and followed.

(2) The steel rods or pipe on which the jacks climb or by which the forms are lifted shall be designed for this purpose. Such rods must be adequately braced where not encased in concrete.

(3) Forms shall be designed to prevent excessive distortion of the structure during the jacking operation.

(4) All vertical slip forms shall be provided with scaffolding or work platforms completely encircling the area of placement.

(5) Jacks and vertical supports shall be positioned in such a manner that the loads do not exceed the rated capacity of the jacks.



(6) The jacks or other lifting devices shall be provided with mechanical dogs or other automatic holding devices to support the slip forms whenever failure of the power supply or lifting mechanism occurs.

(7) The form structure shall be maintained within all design tolerances specified for plumbness during the jacking operation.

(8) Lifting shall proceed steadily and uniformly and shall not exceed the predetermined safe rate of lift. A jacking system, which provides precise, simultaneous movement of the entire form in small preselected increments, is recommended for large structures.

(9) Workmen placing reinforcing steel shall wear safety belts tied off by lanyards or otherwise securely fastened when working above the scaffold level.

(10) The total allowable load on slip form platforms shall be determined by the design engineer and enforced by the field supervisor.

(11) Lateral and diagonal bracing of the forms shall be provided to prevent excessive distortion of the structure during the sliding operation.

(12) While the slide is in operation, the form structure shall be maintained in line and plumb.

(13) A field supervisor experienced in slip form construction shall be present on the deck at all times.

[Statutory Authority: Chapter 49.17 RCW. 89-11-035 (Order 89-03), § 296-155-688, filed 5/15/89, effective 6/30/89.]

#### **WAC 296-155-689 Placing and removal of forms.**

(1) When moved or raised by crane, cableway, A-frame, or similar mechanical device, forms shall be securely attached to slings having a minimum safety factor of five. Use of No. 9 tie wire, fiber rope, and similar makeshift lashing shall be prohibited.

(2) Taglines shall be used in moving panels or other large sections of forms by crane or hoist.

(3) All hoisting equipment, including hoisting cable used to raise and move forms shall have a minimum safety factor incorporated in the manufacturer's design, and the manufacturer's recommended loading shall not be exceeded. Field-fabricated or shop-fabricated hoisting equipment shall be designed or approved by a registered professional engineer, incorporating a minimum safety factor of five in its design. Panels and built-up form sections shall be equipped with metal hoisting brackets for attachment of slings.

(4) Forms intended for use where there is a free fall of over ten feet shall be equipped with adequate scaffolding and guardrails, or employees working on the forms shall be required to wear safety belts during forming and stripping operations.

(5) Vertical forms being raised or removed in sections shall not be released until adequately braced or secured. Overhead forms shall not be released until adequately braced or secured.

(6) Workmen or others at lower levels shall be protected from falling materials. Appropriate warning signs shall be erected along walkways.

(7) Forms shall not be removed until the concrete is cured. The concrete shall be adequately set in order to permit safe removal of the forms, shoring, and bracing.

[Title 296 WAC—p 2068]

Engineer's specifications and local building codes shall be adhered to in determining the length of time forms should remain in place following concrete placement. In addition, tests shall be made on field-cured concrete specimens in order to insure that concrete has obtained sufficient strength to safely support the load prior to removal of forms.

[Statutory Authority: Chapter 49.17 RCW. 89-11-035 (Order 89-03), § 296-155-689, filed 5/15/89, effective 6/30/89.]

**WAC 296-155-690 Appendix to WAC 296-155-684 cast in place concrete.** General requirements for formwork.

(This Appendix is nonmandatory.)

This Appendix serves as a nonmandatory guideline to assist employers in complying with the formwork requirements in §1926.703 (a)(1). Formwork which has been designed, fabricated, erected, braced, supported, and maintained in accordance with Sections 6 and 7 of the American National Standard for Construction and Demolition Operations—Concrete and Masonry Work, ANSI A10.9-1983, shall be deemed to be in compliance with the provision of §1926.703 (a)(1).

(Information collection requirements contained in paragraph (a)(2) were approved by the Office of Management and Budget under control number 1218-0095.)

(1) It shall be the responsibility of the contractor to use accessories which are designed to be compatible.

(2) The design capacity of all lifting devices and accessories shall be known. The devices and accessories with the appropriate capacity shall be used.

(3) Prior to pouring the panels of a tilt-up type construction job, a set of plans or job specifications, including lifting procedures, shall be drawn up.

(a) These plans shall be at the job site and made available upon request.

(b) Any changes made in the rigging procedure of a tilt-up panel or slab shall provide the same degree of safety as required by the original plans.

(c) The plans or specifications shall contain the following information:

(i) The type, size, and location of all lifting inserts.

(ii) The type, size, and location of all brace inserts or fittings for guy wires in each panel and floor or support.

(iii) The size of braces or guys to be used.

(iv) The compression strength which concrete panels must attain prior to being lifted.

(4) The following conditions shall be included in the erection process and shall be incorporated in the design plan:

(a) Braces and all associated components of the bracing system shall be designed to incorporate a safety factor of one and one-half to resist any normal stresses to which they may be subjected, including normal high wind velocity pressures for the area.

(b) Precast concrete wall units, structural framing, and tilt-up wall panels shall be adequately supported to prevent overturning and to prevent collapse until permanent connections are completed.

(c) Floor braces used to secure panel sections shall be placed at an angle of not less than forty-five degrees or

(1989 Ed.)



more than sixty degrees from horizontal when physically possible to install in this manner.

(d) The bracing on all panel sections shall be installed in such a manner as to prevent the panel from accidentally rotating.

(e) Each panel section not secured by other means shall have a minimum of two braces. The braces shall be installed in such a manner as to evenly distribute the load or guy wires, when properly installed, may be used in lieu of stiff leg braces.

(f) If braces are attached to a panel or slab by bolts tightened into inserts installed in holes drilled in concrete, the type of inserts used and method of installation shall be such as to develop the required strength to be maintained for the bracing system.

(g) Inserts to be installed for lifting sections of a panel shall be designed mechanically to maintain a safety factor of three.

(h) Lifting inserts which are embedded or otherwise attached to precast concrete members, other than the tilt-up members, shall be capable of supporting at least four times the maximum intended load applied or transmitted to them.

(i) The compression strength of the concrete shall be such that when the proper type, size, and amount of inserts are installed a minimum safety factor of two will be maintained.

(j) Lifting hardware such as spreader bars, slings, shackles, etc., shall be designed for a safety factor of not less than five and shall not be used whenever the safety factor is reduced below four.

(k) Lifting bolts or other lifting devices which have been bent, worn, or are defective shall be discarded.

(l) The upper and lower sections of telescoping type braces shall be secured by high tensile steel pins or bolts which provide adequate shear strength and which will positively secure against accidental removal.

(m) Manufactured products shall not be altered in a manner which would reduce the safe working load to less than its original value.

(n) Inserts shall be positioned so that bolts, or lifting devices, when inserted, will be perpendicular to the face on which they are placed.

(5) Design of the panels and layout of the pour shall be made in such a manner so that when picking, the top of the panel will be away from the crane. If this is not possible, the contractor shall consult with a representative of the department and the crane company involved to determine the procedure to be followed in lifting and placing in its permanent position safely. Panels shall be lifted and handled in such a manner that they will not strike the hoisting equipment, in case of failure.

(a) Physical stops shall be provided which will prevent the bottom edge of a panel being set from slipping off the edge of its supporting structure.

(b) Tilt-up panels shall not be set when there is a possibility that wind velocity would create a hazardous condition.

(c) A qualified signalman shall be designated and shall consult with the crane operator on lifting procedures prior to making the pick. The signalman shall be

located in such a position during the pick of the panel that he can observe both the crane operator and the employees working in the immediate area.

(d) During the lifting process, workers shall keep clear of the under side of the panel.

(e) Persons not involved in the lifting process shall be kept clear of the hazardous area near where panels are being raised, moved, or placed.

(f) If braces must be removed temporarily during construction, other effective means shall be provided to safely support the panel during the interim period.

(g) Each panel shall be properly braced or otherwise secured prior to removal of the hoisting equipment.

(h) Short panels or sections not otherwise supported by floor, footings, columns or other structure, shall be properly shored.

[Statutory Authority: Chapter 49.17 RCW. 89-11-035 (Order 89-03), § 296-155-690, filed 5/15/89, effective 6/30/89. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-690, filed 1/21/86; Order 74-26, § 296-155-690, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-691 Precast concrete and tilt-up operations.** (1) It shall be the responsibility of the contractor to use accessories which are designed to be compatible.

(2) The design capacity of all lifting devices and accessories shall be known. The devices and accessories with the appropriate capacity shall be used.

(3) Prior to pouring the panels of a tilt-up type construction job, a set of plans or job specifications, including lifting procedures, shall be drawn up.

(a) These plans shall be at the job site and made available upon request.

(b) Any changes made in the rigging procedure of a tilt-up panel or slab shall provide the same degree of safety as required by the original plans.

(c) The plans or specifications shall contain the following information:

(i) The type, size, and location of all lifting inserts.

(ii) The type, size, and location of all brace inserts or fittings for guy wires in each panel and floor or support.

(iii) The size of braces or guys to be used.

(iv) The compression strength which concrete panels must attain prior to being lifted.

(4) The following conditions shall be included in the erection process and shall be incorporated in the design plan:

(a) Braces and all associated components of the bracing system shall be designed to incorporate a safety factor of one and one-half to resist any normal stresses to which they may be subjected, including normal high wind velocity pressures for the area.

(b) Precast concrete wall units, structural framing, and tilt-up wall panels shall be adequately supported to prevent overturning and to prevent collapse until permanent connections are completed.

(c) Floor braces used to secure panel sections shall be placed at an angle of not less than forty-five degrees or more than sixty degrees from horizontal when physically possible to install in this manner.

(d) The bracing on all panel sections shall be installed in such a manner as to prevent the panel from accidentally rotating.

(e) Each panel section not secured by other means shall have a minimum of two braces. The braces shall be installed in such a manner as to evenly distribute the load or guy wires, when properly installed, may be used in lieu of stiff leg braces.

(f) If braces are attached to a panel or slab by bolts tightened into inserts installed in holes drilled in concrete, the type of inserts used and method of installation shall be such as to develop the required strength to be maintained for the bracing system.

(g) Inserts to be installed for lifting sections of a panel shall be designed mechanically to maintain a safety factor of three.

(h) Lifting inserts which are embedded or otherwise attached to precast concrete members, other than the tilt-up members, shall be capable of supporting at least four times the maximum intended load applied or transmitted to them.

(i) The compression strength of the concrete shall be such that when the proper type, size, and amount of inserts are installed a minimum safety factor of two will be maintained.

(j) Lifting hardware such as spreader bars, slings, shackles, etc., shall be designed for a safety factor of not less than five and shall not be used whenever the safety factor is reduced below four.

(k) Lifting bolts or other lifting devices which have been bent, worn, or are defective shall be discarded.

(l) The upper and lower sections of telescoping type braces shall be secured by high tensile steel pins or bolts which provide adequate shear strength and which will positively secure against accidental removal.

(m) Manufactured products shall not be altered in a manner which would reduce the safe working load to less than its original value.

(n) Inserts shall be positioned so that bolts, or lifting devices, when inserted, will be perpendicular to the face on which they are placed.

(5) Design of the panels and layout of the pour shall be made in such a manner so that when picking, the top of the panel will be away from the crane. If this is not possible, the contractor shall consult with a representative of the department and the crane company involved to determine the procedure to be followed in lifting and placing in its permanent position safely. Panels shall be lifted and handled in such a manner that they will not strike the hoisting equipment, in case of failure.

(a) Physical stops shall be provided which will prevent the bottom edge of a panel being set from slipping off the edge of its supporting structure.

(b) Tilt-up panels shall not be set when there is a possibility that wind velocity would create a hazardous condition.

(c) A qualified signalman shall be designated and shall consult with the crane operator on lifting procedures prior to making the pick. The signalman shall be located in such a position during the pick of the panel

that he can observe both the crane operator and the employees working in the immediate area.

(d) During the lifting process, workers shall keep clear of the under side of the panel.

(e) Persons not involved in the lifting process shall be kept clear of the hazardous area near where panels are being raised, moved or placed.

(f) If braces must be removed temporarily during construction, other effective means shall be provided to safely support the panel during the interim period.

(g) Each panel shall be properly braced or otherwise secured prior to removal of the hoisting equipment.

(h) Short panels or sections not otherwise supported by floor, footings, columns or other structure, shall be properly shored.

[Statutory Authority: Chapter 49.17 RCW. 89-11-035 (Order 89-03), § 296-155-691, filed 5/15/89, effective 6/30/89.]

**WAC 296-155-692 Requirements for lift-slab operations.** (1) In addition to the general requirements of this section, employers engaged in lift-slab operations shall comply with the existing specific requirements for lift-slab operations which are prescribed in ANSI A10.9-1970. These requirements, found in Section 11 of the American National Standard Safety Requirements for Concrete Construction and Masonry Work, ANSI A10.9-1970, are reprinted in the Appendix to this section. In addition, there are applicable requirements in WAC 296-155-375 (1) through (3) which apply to jacks in general, and jacks used specifically in lift-slab construction.

(2) Lift-slab operations shall be designed and planned by a qualified professional engineer or architect. Such plans and designs shall include detailed instructions and sketches indicating the prescribed method of erection.

(3) Jacking equipment.

(a) Jacking equipment shall not be loaded beyond its safe working capacity.

(b) The threaded rods and other members that transmit loads to the jacks shall have a minimum safety factor of 2.5.

(c) Jacks shall be designed and installed so they will not continue to lift when overloaded.

(d) Jacks shall be installed with a safety device which will enable them to continue to support the load in any position should jack malfunction and lose its lifting ability.

[Statutory Authority: Chapter 49.17 RCW. 89-11-035 (Order 89-03), § 296-155-692, filed 5/15/89, effective 6/30/89.]

**WAC 296-155-694 Appendix to WAC 296-155-692 lift-slab operations.** (Reprinted from ANSI A10.9-1970.)

(This Appendix is mandatory.)

Section 11. Lift-Slab Operations.

11.1 General. The safety requirements and recommendations in Section 11 apply specifically to lift-slab construction operations.

11.2 Design and Planning. Lift-slab operations shall be designed and planned by a qualified professional engineer or architect. Such plans and designs shall include

detailed instructions and sketches indicating the prescribed method of erection.

### 11.3 Jacking Equipment.

11.3.1 Jacking equipment shall not be loaded beyond its safe working capacity, and then threaded rods and other members that transmit loads to the jacks shall have a minimum safety factor of 2.5. Jacking equipment used in lift-slab operations shall meet the criteria in 11.3.1 through 11.3.4. (Note: ANSI has interpreted this provision to mean that the safety factor of 2.5 must be met for all jacking components such as jacks, threaded rods, lifting nuts, lifting angles, as well as shearheads, columns and footings.)

11.3.2 Jacks shall be so designed and installed so that they will not continue to lift when overloaded.

11.3.3 Jacks shall be installed with a safety device which will enable them to continue to support the load in any position should the jack malfunction and lose its lifting ability.

11.3.4 The maximum number of manually-controlled jacks on one slab shall be limited to 14, and in no event should the number be too great to permit the operator to maintain the slab level within specified tolerances.

11.4 Uniform Lifting. Jacking operations shall be synchronized in such a manner as to insure even and uniform lifting of the slab. During lifting, all points of the slab support shall be kept within one-half inch of that needed to maintain the slab in a level position. If leveling is automatically controlled, a device shall be installed which will stop the operation when the one-half-inch tolerance is exceeded or when there is a malfunction in the jacking system. If level is maintained by manual controls, such controls shall be located in a central location and attended by a trained operator while lifting is in progress.

11.5 Falling Hazard. No one shall be permitted under the slab during jacking operations. (Note: ANSI has interpreted this provision as follows: "No one is permitted in the building during jacking operations except those employees required for the jacking operation and to secure slabs.")

[Statutory Authority: Chapter 49.17 RCW. 89-11-035 (Order 89-03), § 296-155-694, filed 5/15/89, effective 6/30/89.]

### WAC 296-155-695 Miscellaneous concrete construction. (1) General provisions.

(a) Deadheads used in post tensioning of tendons shall be the type that will increase the grip on the cable as the tension is increased.

(b) Proper means and equipment shall be used to prevent the over-tensioning of the tendons.

(c) Only qualified workers shall perform this type work.

#### (2) Prestressed and poststressed concrete operations.

(a) Anchor fitting. In utilizing anchor fittings for tensioned strands, the recommendations and instructions of the supplier concerning installation, maintenance, and replacement shall be followed.

(b) Tools and strand vices shall be kept clean and in good repair.

(c) Safety factor.

(i) Expendable strand deflection devices used to pre-tension concrete members shall have a minimum safety factor of two.

(ii) Reusable strand deflection devices shall have a minimum safety factor of three.

#### (d) Jacking operations.

(i) During jacking operations of any tensioning element or group of tensioning elements, the anchors shall be kept turned up close to the anchorplate.

(ii) No one shall be permitted to stand in line or directly over the jacking equipment during tensioning operations.

(iii) Employees shall not stand behind the jack during tensioning operations.

(e) Jacking and pulling equipment. Pulling headers, bolts, and hydraulic rams shall be frequently inspected for indication of fatigue, and the threads on bolts and nuts inspected for diminishing cross section.

(f) Storage. Stressed members shall be stored on a level base and adequately supported during storage and transportation to prevent tipping.

#### (g) Rigging.

(i) Stressed members shall be handled at pick points specifically designated on the manufacturer's drawings.

(ii) Stressed members shall be lifted with lifting devices recommended by the manufacturer or the engineer in charge.

(iii) No one shall be allowed under stressed members during lifting and erection.

[Statutory Authority: Chapter 49.17 RCW. 89-11-035 (Order 89-03), § 296-155-695, filed 5/15/89, effective 6/30/89. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-695, filed 1/21/86; Order 74-26, § 296-155-695, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-697 Requirements for masonry construction.** (1) A limited access zone shall be established whenever a masonry wall is being constructed. The limited access zone shall conform to the following:

(2) The limited access zone shall be established prior to the start of construction of the wall.

(3) The limited access zone shall be equal to the height of the wall to be constructed plus four feet, and shall run the entire length of the wall.

(4) The limited access zone shall be established on the side of the wall which will be unscaffolded.

(5) The limited access zone shall be restricted to entry by employees actively engaged in constructing the wall. No other employees shall be permitted to enter the zone.

(6) The limited access zone shall remain in place until the wall is adequately supported to prevent overturning and to prevent collapse unless the height of wall is over eight feet, in which case, the limited access zone shall remain in place until the requirements of subsection (9) of this section have been met.

(7) All masonry walls over eight feet in height shall be adequately braced to prevent overturning and to prevent collapse unless the wall is adequately supported so that it will not overturn or collapse. The bracing shall remain in place until permanent supporting elements of the structure are in place.

(8) Employees engaged in cutting or chipping shall wear suitable eye protection in accordance with WAC 296-155-215.

(9) Masonry saws shall be constructed, guarded and operated in accordance with ANSI A10.9-1983. Safety requirements for concrete construction and masonry work and in accordance with WAC 296-155-367.

(10) Persons charged with operation of derricks used for stone setting shall be qualified in that type of work.

(11) Stone shall be set directly on the wall by the derrick.

(12) Breast derricks when used in setting stone shall be secured against a slip or kick back and guyed with wire cables. Provide hold down line to prevent derrick from falling back.

(13) Stone cutters shall wear goggles while trimming stone or cutting holes.

(14) Pins shall be tested for security before stone is hoisted.

(15) Hoisting cables shall be protected from chafing and wearing over corners.

(16) Mason's mortar mixers shall have a bar-type grill installed over the mixer opening. The guard shall be installed with an automatic disconnect switch to stop the mixer tub rotation and prevent the mixer from starting whenever the guard is not in place.

[Statutory Authority: Chapter 49.17 RCW. 89-11-035 (Order 89-03), § 296-155-697, filed 5/15/89, effective 6/30/89.]

**WAC 296-155-699 Appendix A to Subpart Q--References to Subpart Q of Part 1926.** (This Appendix is nonmandatory.)

The following nonmandatory references provide information which can be helpful in understanding and complying with the requirements contained in Subpart Q.

- Accident Prevention Manual for Industrial Operations; Eighth Edition; National Safety Council.

- Building Code Requirements for Reinforced Concrete (ACI 318-83).

- Formwork for Concrete (ACI SP-4).

- Recommended Practice for Concrete Formwork (ACI 347-78).

- Safety Requirements for Concrete and Masonry Work (ANSI A10.9-1983).

- Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens (ASTM C39-86).

- Standard Test Method for Making and Curing Concrete Test Specimens in the Field (ASTM C31-85).

- Standard Test Method for Penetration Resistance of Hardened Concrete (ASTM C803-82).

- Standard Test Method for Compressive Strength of Concrete Cylinders Cast In-Place in Cylindrical Molds (ASTM C873-85).

- Standard Method for Developing Early Age Compressive Test Values and Projecting Later Age Strengths (ASTM C918-80).

- Recommended Practice for Inspection and Testing Agencies for Concrete, Steel and Bituminous Materials as Used in Construction (ASTM E329-77).

- Method of Making and Curing Concrete Test Specimens in the Laboratory (ASTM C192-88).

- Methods of Obtaining and Testing Drilled Cores and Sawed Beams of Concrete (ASTM C42-87).

- Methods of Securing, Preparing and Testing Specimens from Hardened Lightweight Insulating Concrete for Compressive Strength (ASTM C513-86).

- Test Method for Comprehensive Strength of Lightweight Insulating Concrete (ASTM C495-86).

- Method of Making, Accelerating Curing, and Testing of Concrete Compression Test Specimens (ASTM C684-81).

- Test Method for Compressive Strength of Concrete Using Portions of Beams Broken in Flexure (ASTM C116-68 (1980)).

[Statutory Authority: Chapter 49.17 RCW. 89-11-035 (Order 89-03), § 296-155-699, filed 5/15/89, effective 6/30/89.]

## Part P STEEL ERECTION

### WAC

296-155-700	General requirements.
296-155-705	Flooring requirements.
296-155-710	Structural steel assembly.
296-155-715	Bolting, riveting, fitting-up, and plumbing-up.
296-155-720	Safe walking surfaces on structural members.

**WAC 296-155-700 General requirements.** (1) Erection gangs on structural steel erection shall work under the direction of experienced foreman.

(2) Workers shall not ride on steel being hoisted, nor slide down ropes, columns or ladders.

(3) Wire rope slings shall be used when lifting loads. Care shall be taken to avoid sharp bends by using wood or similar type padding between wire rope and load. Reinforcing steel shall not be lifted by bundling ties.

(4) If float scaffolds are used during steel erection, they shall be used in accordance with WAC 296-155-485(24).

(5) Employees shall be provided with safety belts in accordance with WAC 296-155-225 when they are working on float scaffolds.

(6) On jobs where ordinary precautions would prove impractical, nets shall be provided. Contracting authorities shall specify in contract when it has been determined that nets are required.

(7) The use of safety belts, lanyards and lifelines in steel erection shall be in accordance with WAC 296-155-225.

(a) When connecting beams at the periphery of a building or structure where the fall distance is greater than twenty-five feet, employees shall be tied-off by approved safety belts and lifelines:

(i) To either peripheral columns;

(ii) Pendant lines secured at the tops of peripheral columns;

(iii) Catenary lines;

(iv) Other secure anchorage points.

(b) When practical, employees shall coon or walk the bottom inside flange of peripheral beams when it is necessary to release chokers, land intermediate members, or perform other work on the peripheral beams.

(c) Pendant lines, catenary lines and other lines used to secure workers shall be capable of supporting a minimum dead weight of five thousand four hundred pounds.

(d) If the procedure specified in (a) of this subsection is impractical, perimeter safety nets shall be installed at a distance of no more than twenty-five feet below the work surface and extend at least eight feet beyond the perimeter of the building or structure. Nets shall meet the requirements set forth in the applicable portions of WAC 296-155-230.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-700, filed 1/21/86; Order 76-29, § 296-155-700, filed 9/30/76; Order 74-26, § 296-155-700, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-705 Flooring requirements.** (1) Permanent flooring—Skeleton steel construction in tiered buildings.

(a) The permanent floors shall be installed as the erection of structural members progresses, and there shall be not more than eight stories between the erection floor and the uppermost permanent floor, except where the structural integrity is maintained as a result of the design.

(b) At no time shall there be more than four floors or 48 feet of unfinished bolting or welding above the foundation or uppermost permanently secured floor.

(2) Temporary flooring—Skeleton steel construction in tiered buildings.

(a)(i) The derrick or erection floor shall be solidly planked or decked over its entire surface except for access openings. Planking or decking of equivalent strength, shall be of proper thickness to carry the working load. Planking shall be not less than 2 inches thick full size undressed, and shall be laid tight and secured to prevent movement.

(ii) On buildings or structures not adaptable to temporary floors, and where scaffolds are not used, safety nets shall be installed and maintained whenever the potential fall distance exceeds two stories or 25 feet. The nets shall be hung with sufficient clearance to prevent contacts with the surface of structures below.

(iii) Floor periphery – safety railing. A standard railing including midrail of 1/2-inch wire rope or equivalent shall be installed at the periphery (including all floor openings) of all temporary-planked or temporary metal-decked floors of tier buildings and other multi-floored structures during structural steel assembly.

(b)(i) Where skeleton steel erection is being done, a tightly planked and substantial floor shall be maintained within two stories or twenty-five feet, whichever is less, below and directly under that portion of each tier of beams on which any work is being performed, except when gathering and stacking temporary floor planks on a lower floor, in preparation for transferring such planks for use on an upper floor. Where such a floor is not practicable, subsection (2)(a)(ii) of this section applies.

(ii) When gathering and stacking temporary floor planks, the planks shall be removed successively, working toward the last panel of the temporary floor so that the work is always done from the planked floor.

(iii) When gathering and stacking temporary floor planks, from the last panel, the employees assigned to such work shall be protected by safety belts with safety lines attached to a catenary line or other substantial anchorage.

(3) Flooring – other construction.

(a) In the erection of a building having double wood floor construction, the rough flooring shall be completed as the building progresses, including the tier below the one on which floor joists are being installed.

(b) For single wood floor or other flooring systems, the floor immediately below the story where the floor joists are being installed shall be kept planked or decked over.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-705, filed 1/21/86; Order 76-29, § 296-155-705, filed 9/30/76; Order 74-26, § 296-155-705, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-710 Structural steel assembly.** (1) During the final placing of solid web structural members, the load shall not be released from the hoisting line until the members are secured with not less than two bolts, or the equivalent at each connection and drawn up wrench tight.

(2) Open web steel joists shall not be placed on any structural steel framework unless such framework is safely bolted or welded.

(3)(a) In steel framing, where bar joists are utilized, and columns are not framed in at least two directions with structural steel members, a bar joist shall be field-bolted at columns to provide lateral stability during construction.

(b) Where longspan joists or trusses, 40 feet or longer, are used, a center row of bolted bridging shall be installed to provide lateral stability during construction prior to slacking of hoisting line.

(c) No load shall be placed on open web steel joists until these security requirements are met.

(4) Tag lines shall be used for controlling loads.

[Order 74-26, § 296-155-710, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-715 Bolting, riveting, fitting-up, and plumbing-up.** (1) General requirements.

(a) Containers shall be provided for storing or carrying rivets, bolts, and drift pins, and secured against accidental displacement when aloft.

(b) Pneumatic hand tools shall be disconnected from the power source, and pressure in hose lines shall be released, before any adjustments or repairs are made.

(c) Air line hose sections shall be tied together except when quick disconnect couplers are used to join sections.

(d) Eye protection shall be provided in accordance with Part C of this chapter.

(2) Bolting.

(a) When bolts or drift pins are being knocked out, means shall be provided to keep them from falling.

(b) Impact wrenches shall be provided with a locking device for retaining the socket.

(3) Riveting.

(a) Riveting shall not be done in the vicinity of combustible material unless precautions are taken to prevent fire.

(b) When workers are below and rivet heads are knocked off or backed out, means shall be provided to keep the rivet heads from falling on such workers.

(c) A safety wire shall be properly installed on the snap and on the handle of the pneumatic riveting hammer and shall be used at all times. The wire size shall be not less than No. 9 (B & S gauge), leaving the handle and annealed No. 14 on the snap or equivalent.

(d) The rivet heating equipment shall be kept as near as possible to the riveting gang with whom the rivet heater is working.

(e) Hot rivets shall never be thrown across shaftways or towards the outside of a building.

(f) When riveting is done on an outside wall, the rivets shall be passed by hand or thrown parallel to the wall.

(g) Metal cone shaped buckets shall be used for catching hot rivets.

(h) Riveters shall avoid allowing the air hose to become wrapped or tangled around their legs.

(i) Empty bolt and rivet kegs shall be removed from the floor as soon as possible.

(j) Pails and hand lines shall be used when raising or lowering bolts, rivets or small tools.

(k) The nozzle of the riveting gun shall be periodically inspected and the wire attachment not allowed to become worn so as to permit the nozzle to fly out with the air pressure.

(l) Electric welding equipment shall not be used where wire rope is used to suspend scaffolds.

(4) Plumbing-up.

(a) Connections of the equipment used in plumbing-up shall be properly secured.

(b) The turnbuckles shall be secured to prevent unwinding while under stress.

(c) Plumbing-up guys related equipment shall be placed so that employees can get at the connection points.

(d) Plumbing-up guys shall be removed only under the supervision of a competent person.

(5) Wood planking shall be of proper thickness to carry the working load, but shall be not less than 2 inches thick full size undressed, exterior grade plywood, at least 3/4-inch thick, or equivalent material.

(6) Metal decking of sufficient strength shall be laid tight and secured to prevent movement.

(7) Planks shall overlap the bearing on each end by a minimum of 12 inches.

(8) Wire mesh, exterior plywood, or equivalent, shall be used around columns where planks do not fit tightly.

(9) Provisions shall be made to secure temporary flooring against displacement.

(10) All unused openings in floors, temporary or permanent, shall be completely planked over or guarded in accordance with Part K of this chapter.

(11) Temporary bracing and/or guying shall be utilized to stabilize a structure until construction has been completed.

(12) Employees shall use safety belts in accordance with WAC 296-155-225 when they are working on float scaffolds.

[Order 76-29, § 296-155-715, filed 9/30/76; Order 74-26, § 296-155-715, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-720 Safe walking surfaces on structural members.** (1) Structural members with studs, dowels or shear connectors installed on the top side shall not be used as a walkway and/or means of access unless such studs, dowels or shear connectors are covered with suitable material and in such a manner as to provide a walking surface at least as stable and free of hazards as the top surface of the member would provide without attachments installed. For the purpose of this section, "stud," shall mean all protruding metal attachments to structural members.

(2) If such structural member is ten feet or more above ground or floor level, employees walking or working on such member shall be protected by a safety belt in accordance with WAC 296-155-225.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-720, filed 1/21/86; Order 74-26, § 296-155-720, filed 5/7/74, effective 6/6/74.]

## Part Q

### TUNNELS AND SHAFTS, CAISSONS, COFFERDAMS, AND COMPRESSED AIR

#### WAC

296-155-725	Definitions applicable to this part.
296-155-730	Tunnels and shafts.
296-155-735	Caissons.
296-155-740	Cofferdams.
296-155-745	Compressed air.
296-155-74501	Appendix A—Decompression tables.

**WAC 296-155-725 Definitions applicable to this part.** (1) "Bulkhead" means an airtight structure separating the working chamber from free air or from another chamber under a lesser pressure than the working pressure.

(2) "Caisson" means a wood, steel, concrete or reinforced concrete, air- and water-tight chamber in which it is possible for persons to work under air pressure greater than atmospheric pressure to excavate material below water level.

(3) "Cofferdam" means a watertight barricade or enclosure erected, sunk, driven or otherwise fabricated to permit the performance of work where hydrostatic pressure exists.

(4) "Decanting" means a method used for decompressing under emergency circumstances. In this procedure, the employees are brought to atmospheric pressure with a very high gas tension in the tissues and then immediately recompressed in a second and separate chamber or lock.

(5) "Emergency locks" means a lock designed to hold and permit the quick passage of an entire shift of employees.

(6) "High air" means air pressure used to supply power to pneumatic tools and devices.



(7) "Low air" means air supplied to pressurize working chambers and locks.

(8) "Man lock" means a chamber through which persons pass from one air pressure environment into another.

(9) "Materials lock" means a chamber through which materials and equipment pass from one air pressure environment into another.

(10) "Medical lock" means a special chamber in which employees are treated for decompression illness. It may also be used in pre-employment physical examinations to determine the adaptability of the prospective employee to changes in pressure.

(11) "Normal condition" means one during which exposure to compressed air is limited to a single continuous working period followed by a single decompression in any given 24-hour period; the total time of exposure to compressed air during the single continuous working period is not interrupted by exposure to normal atmospheric pressure, and a second exposure to compressed air does not occur until at least 12 consecutive hours of exposure to normal atmospheric pressure has elapsed since the employee has been under pressure.

(12) "Pressure" means a force acting on a unit area. Usually shown as pounds per square inch. (p.s.i.)

(13) "Absolute pressure" (p.s.i.a.) means the sum of the atmospheric pressure and gauge pressure (p.s.i.g.)

(14) "Atmospheric pressure" means the pressure of air at sea level, usually 14.7 p.s.i.a. (1 atmosphere), or 0 p.s.i.g.

(15) "Gauge pressure" (p.s.i.g.) means pressure measured by a gauge and indicating the pressure exceeding atmospheric.

(16) "Safety screen" means an air- and water-tight diaphragm placed across the upper part of a compressed air tunnel between the face and bulkhead, in order to prevent flooding the crown of the tunnel between the safety screen and the bulkhead, thus providing a safe means of refuge and exit from a flooding or flooded tunnel.

(17) "Special decompression chamber" means a chamber to provide greater comfort for employees when the total decompression time exceeds 75 minutes.

(18) "Working chamber" means the space or compartment under air pressure in which the work is being done.

(19) "C.F.R." means Code of Federal Regulations.

(20) "MSHA" means Mine Safety and Health Administration.

(21) "NIOSH" means National Institute for Occupational Safety and Health.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-725, filed 1/21/86; Order 74-26, § 296-155-725, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-730 Tunnels and shafts. (1) General.**

(a) The specific requirements of this Part Q, Tunnels, shafts, caissons, cofferdams, and compressed air, shall be met as well as the applicable provisions of all other parts of this chapter and chapter 296-36 WAC "Safety standards for compressed air work."

(b) Safe means of access shall be provided and maintained to all working places.

(c) When ladders and stairways are provided in shafts and steep inclines, they shall meet the requirements of Parts J and K of this chapter.

(d) Access to unattended underground openings shall be restricted by gates or doors. Unused chutes, manways, or other openings shall be tightly covered, bulkheaded, or fenced off, and posted. Conduits, trenches, and manholes shall meet the requirements of Parts K and N of this chapter.

(e) Subsidence areas that present hazards shall be fenced and posted.

(f) Each operation shall have a check-in and check-out system that will provide positive identification of every employee underground. An accurate record and location of the employees shall be kept on the surface.

(g) In tunnels (other than hard rock) timber sets, steel rings, steel frames, concrete liners or other engineered tunnel support systems shall be used. Every tunnel support system shall be designed by a licensed professional engineer. Design specifications shall be available at the worksite.

**(2) Emergency provisions.**

(a) Evacuation plans and procedures shall be developed and made known to the employees.

(b) Emergency hoisting facilities shall be readily available at shafts more than 50 feet in depth, unless hoisting facilities are provided that are independent of electrical power failures. A boatswain's chair shall meet the requirements of Part J of this chapter.

(c) MSHA-NIOSH approved self-rescuers shall be available near the advancing face to equip each face employee. Such equipment shall be on the haulage equipment and in other areas where employees might be trapped by smoke or gas, and shall be maintained in good condition.

(d) Telephone or other signal communication shall be provided between the work face and the tunnel portal, and such systems shall be independent of the tunnel power supply.

**(3) Air quality and ventilation.**

(a) Air quality and quantity shall be as established by chapter 296-62 WAC.

(i) Instruments shall be provided to test the atmosphere quantitatively for carbon monoxide, nitrogen dioxide, flammable or toxic gases, dusts, mists, and fumes that occur in the tunnel or shaft. Tests shall be conducted as frequently as necessary to assure that the required quality and quantity of air is maintained. A record of all tests shall be maintained and be kept available.

(ii) Field-type oxygen analyzers, or other suitable devices, shall be used to test for oxygen deficiency.

(iii) Respirators shall not be substituted for environmental control measures. However, where environmental controls have not yet been developed, or when necessary by the nature of the work involved (for example, welding, sand blasting, lead burning), an employee may work for short periods of time in concentrations of airborne



contaminants which exceed the limit of permissible excursions referred to in items (iv) and (v) of this subdivision, if such employee wears a respiratory protective device approved by MSHA-NIOSH as protection against the particular hazards involved.

(iv) Exposure to airborne contaminants shall not exceed the levels established by chapter 296-62 WAC.

(v) Employees shall be withdrawn from areas in which there is a concentration of an airborne contaminant which exceeds the threshold limit value listed for that contaminant.

(vi) Atmospheres in all active areas shall contain at least 20 percent oxygen.

(b) Ventilation.

(i) Tunnels shall be provided with mechanically induced primary ventilation in all work areas. The direction of airflow shall be reversible.

(ii) Ventilation doors, not operated mechanically, shall be designed and installed so that they are self-closing and will remain closed regardless of the direction of the air movement.

(iii) When there has been a failure of ventilation, and ventilation has been restored in a reasonable time, all places where flammable gas may have accumulated shall be examined by a competent person and determined to be free of flammable gas before power is restored and work resumed.

(iv) When the main fan or fans have been shut down with all employees out of the adit, tunnel or shaft, no employee, other than those qualified to examine the adit, tunnel or shaft, or other authorized employee, shall go underground until the fans have been started, the work areas examined for gas and other hazards, and declared safe.

(v) The supply of fresh air shall not be less than 200 cubic feet per minute for each employee underground. The linear velocity of the air flow in the tunnel bore shall not be less than 30 feet per minute in those tunnels where blasting or rock drilling is conducted or where there are other conditions that are likely to produce dusts, fumes, vapors, or gases in harmful quantities.

(vi) If 1.5 percent or higher concentration of flammable gas is detected in air returning from an underground working place or places, the employees shall be withdrawn and the power cut off to the portion of the area endangered by such flammable gas until the concentration of such gas is reduced to 1 percent or less.

(vii) Internal combustion engines other than mobile diesel shall not be used underground. Mobile diesel-powered equipment used underground shall be certified by the Bureau of Mines, U.S. Department of the Interior or the Mine Safety and Health Administration, United States Department of Labor according to their publications "Mechanical Equipment for Mines—Tests for Permissibility and Suitability, 30 C.F.R. Part 32, Mobile Diesel Power Equipment for Non-Coal Mines, July 1, 1983."

(viii) Application shall be made to the mining section, division of industrial safety and health, Department of Labor and Industries, for permission to use specified

diesel equipment in a specified underground area and shall include the following:

(A) The type of construction and complete identification data and specifications including analysis of the undiluted exhaust gases of the diesel equipment.

(B) The location where the diesel equipment is to be used.

(C) Before the diesel equipment is taken underground, written permission shall be obtained from the division of industrial safety and health or its duly authorized representative. A satisfactory test on surface, to show that the exhaust gases do not exceed the maximum percentage of carbon monoxide permitted, shall be required.

(D) Diesel equipment shall only be used underground where the ventilation is controlled by mechanical means and shall not be operated if the ventilating current is less than 75 CFM per horsepower based on the maximum brake horsepower of the engines.

(E) Air measurements shall be made at least once daily in the diesel engine working area and the measurements entered in the Underground Diesel Engine Record Book. Permissible maximum amounts of noxious gases are as follows:

At engine exhaust ports	Carbon Monoxide	.10%	1,000 ppm <sup>a</sup>
Next to equipment	Carbon Monoxide	.005%	50 ppm
General atmosphere	Carbon Monoxide	.005%	50 ppm
General atmosphere	Nitrogen Dioxide	.0003%	3 ppm
General atmosphere	Aldehydes	.0002%	2 ppm

<sup>a</sup> Parts of vapor or gas per million parts of contaminated air by volume at 25°C and 760 mm Hg. pressure.

(4) Illumination.

(a) Sufficient lighting shall be provided, in accordance with the requirements of Table B-3 of part B of this chapter, to permit safe operations at the face as well as in the general tunnel or shaft area and at the employees' workplace.

(5) Fire prevention and control.

(a) General.

(i) The requirements for fire prevention and protection specified in part D of this chapter shall be complied with in all tunnel and shaft operations.

(ii) Signs warning against smoking and open flames shall be posted so that they can be readily seen in areas or places where fire or explosion hazards exist.

(iii) The carrying of matches, lighters, or other flame-producing smoking materials shall be prohibited in all underground operations where fire or explosion hazards exist.

(iv) Not more than a 1 day's supply of diesel fuel shall be stored underground.

(v) Gasoline shall not be taken, stored, or used underground. Where oxygen and petroleum gases are used underground in tunnels and shafts for welding, cutting and heat-treating operations, all applicable ventilation standards shall be enforced to prevent the accumulation of flammable or hazardous gases. These ventilation standards are found in WAC 296-155-730(3) "Air quality and ventilation" and ANSI Z49.1-1967 "Safety in Welding and Cutting."

(vi) Oil, grease, or fuel stored underground shall be kept in tightly sealed containers in fire-resistant areas, at safe distances from explosives magazines, electrical installations, and shaft stations.

(vii) Air that has passed through underground oil or fuel-storage areas shall not be used to ventilate working areas.

(viii) Approved fire-resistant hydraulic fluids shall be used in powered hydraulically actuated underground machinery and equipment unless such equipment is protected by multipurpose fire extinguisher(s) at least 4A:40B:C, or by a fire suppression system, either of which shall be suitable for the type and size of hydraulic equipment involved.

(ix) Fires shall not be built underground.

(x) Noncombustible barriers shall be installed below welding or burning operations in or over a shaft or raise.

(xi) Fire extinguishers or equivalent protection shall be provided at the head and tail pulleys or underground belt conveyors and at 300-foot intervals along the belt line.

(xii) At tunnel operations, employing 25 or more employees at one time underground at least two rescue crews (10 employees divided between shifts) shall be trained annually in rescue procedures, in the use, care, and limitations of oxygen breathing apparatus, and the use and maintenance of firefighting equipment. Not less than one rescue crew (5 employees) shall be trained in smaller operations.

(6) Personal protective equipment. Protective clothing or equipment shall be worn as specified in parts B and C of this chapter.

(7) Noise.

(a) Permissible noise exposures shall conform to those specified in part B of this chapter.

(8) Ground support.

(a) Tunnel portal area. Portals shall be protected and supported where loose soil or rock or fractured material is encountered.

(b) Tunnel area.

(i) The employer shall examine and test the roof, face, and walls of the work area at the start of each shift and frequently thereafter.

(ii) Loose ground shall be taken down or supported. Ground conditions along haulage ways and travelways shall be examined periodically and scaled or supported as necessary.

(iii) Torque meters and torque wrenches shall be available at tunnels where rock bolts are used for ground support. Frequent tests shall be made to determine if bolts meet the required torque. The test frequency shall be determined by rock conditions and distance from vibration sources.

(iv) Damaged or dislodged tunnel supports, whether steel sets or timber, shall be repaired and replaced. New supports shall be installed whenever possible before removing the damaged supports.

(v) All sets, including horseshoe-shaped or arched rib steel sets, shall be designed and installed so that the bottoms will have required anchorage to prevent pressures from pushing them inward into the excavation.

Lateral bracing shall be provided between sets to further stabilize the support.

(c) Shafts.

(i) Small diameter shafts, which employees are required to enter, shall be provided with a steel casing, concrete pipe, timber, or other material of required strength to support the surrounding earth.

(ii) The casing and bracing shall be provided the full depth of the shaft, or at least 5 feet into solid rock if possible, and shall extend at least 1 foot above ground level.

(iii) All wells or shafts over four feet in depth shall be retained with lagging, spiling, or casing.

(iv) In shafts, the employer shall inspect the walls, ladders, timbers, blocking, and wedges of the last set to determine if they have loosened following blasting operations. Where found unsafe, corrections shall be made before shift operations are started.

(v) Safety belts shall be worn on skips and platforms used in shafts by crews when the skip or cage does not occlude the opening to within 1 foot of the sides of the shaft, unless guardrails or cages are provided.

(9) Drilling.

(a) Equipment that is to be used during a shift shall be inspected each shift by a competent person. Equipment defects affecting safety shall be corrected before the equipment is used.

(b) The drilling area shall be inspected for hazards before starting the drilling operations.

(c) Employees shall not be allowed on a drill mast while the drill bit is in operation.

(d) When a drill is being moved from one drilling area to another, drill steel, tools, and other equipment shall be secured, and the mast placed in a safe position.

(e) Receptacles or racks shall be provided for drill steel stored on jumbos.

(f) Before drilling cycle is started, warning shall be given to persons working below jumbo decks.

(g) Drills on columns shall be anchored firmly before drilling is started and shall be retightened frequently thereafter.

(h) The employer shall provide mechanical means for lifting drills, roof bolts, mine straps, and other unwieldy heavy material to the top decks of jumbos over 10 feet in height.

(i) The employer shall provide stair access to jumbo decks wide enough to accommodate two persons if the deck is over 10 feet in height.

(j) On jumbo decks over 10 feet in height, guardrails which are removable (pipe in sockets with chain hand-rail), or equal, shall be provided on all sides and back platforms.

(k) Scaling bars shall be in good condition at all times, and blunted and severely worn bars shall not be used.

(l) When jumbos are being moved, riders will not be allowed on the jumbo unless they are assisting the driver.

(m) Before commencing the drill cycle, the face and lifters shall be examined for misfires (residual explosives) and, if found, they shall be removed before drilling

commences at the face. Lifters shall not be drilled through blasted rock (muck) or water.

(n) Air lines that are buried in the invert shall be identified by signs, posted nearby, warning all personnel.

(10) Blasting. All blasting and explosives-handling operations shall be conducted in compliance with chapter 296-52 WAC.

(11) Haulage.

(a) Equipment that is to be used during a shift shall be inspected by a competent person each shift. Equipment defects affecting safety shall be corrected before the equipment is used.

(b) Powered mobile equipment shall be provided with adequate brakes.

(c) Powered mobile haulage equipment shall be provided with audible warning devices. Lights shall be provided at both ends.

(d) Cab windows shall be of safety glass, or equivalent, in good condition, and shall be kept clean.

(e) Adequate backstops or brakes shall be installed on inclined conveyor drive units to prevent conveyors from running in reverse and creating a hazard to employees.

(f) No employee shall be permitted to ride a power-driven chain, belt, or bucket conveyor, unless the conveyor is specifically designed for transportation of employees.

(g) The employer shall not permit employees to ride in dippers, shovel buckets, forks, clamshells, or in the beds of dump trucks, or on haulage equipment not specifically designed or adapted for the transportation of employees.

(h) Electrically powered mobile equipment shall not be left unattended unless the master switch is in the off position, all operating controls are in the neutral position, and the brakes are set, or other equivalent precautions are taken against rolling.

(i) When dumping cars by hand, the car dumps shall be provided with tie-down or bumper blocks to prevent cars from over-turning.

(j) Rocker-bottom or bottom-dump cars shall be equipped with positive locking devices.

(k) Equipment which is to be hauled shall be so loaded and protected as to prevent sliding or spillage.

(l) Parked railcars shall be blocked securely.

(m) Berms, bumper blocks, safety hooks, or similar means shall be provided to prevent overtravel and over-turning at dumping locations.

(n) Where necessary, bumper blocks, or the equivalent, shall be provided at all track dead ends.

(o) Supplies, materials, and tools, other than small handtools, shall not be transported with employees in mantrip cars.

(12) Electrical equipment.

(a) Electrical equipment shall conform to the requirements of part I of this chapter.

(b) Powerlines shall be well separated or insulated from waterlines, telephone lines, and airlines.

(c) Oil-filled transformers shall not be used underground unless they are located in a fire-resistant enclosure and surrounded by a dike to contain the contents of the transformers in event of a rupture.

(13) Hoisting.

(a) Hoisting machines, either powered or hand operated, shall be worm-gear or powered both ways. The design must be such that when the power is stopped, the load cannot move.

(b) Controls for powered hoists shall be of the deadman type with a nonlocking switch or control.

(c) A device to shut off the power shall be installed ahead of the operating control.

(d) Hand-operated release mechanisms, which can permit the load to descend faster than the speed rating, shall not be used.

(e) Hoist machines with cast metal parts shall not be used.

(f) Every hoist shall be tested with twice the maximum load before being put into operation, and annually thereafter.

(g) All anchorages of hoists shall be inspected at the beginning of each shift.

(h) An enclosed covered metal cage shall be used to raise and lower persons in the shaft. The cage shall be designed with a safety factor of 4 and shall be load-tested prior to use. The exterior of the cage shall be free of projections or sharp corners. Only closed shackles shall be used in the cage rigging.

(i) If the cage is equipped with a door, a positive locking device shall be installed to prevent the door from opening accidentally while the cage is being lowered or raised while hoisting or lowering employees.

[Statutory Authority: RCW 49.17.040 and 49.17.050, 86-03-074 (Order 86-14), § 296-155-730, filed 1/21/86; Order 76-29, § 296-155-730, filed 9/30/76; Order 74-26, § 296-155-730, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-735 Caissons.** (1) Wherever, in caisson work in which compressed air is used, and the working chamber is less than 11 feet in length, and when such caissons are at any time suspended or hung while work is in progress so that the bottom of the excavation is more than 9 feet below the deck of the working chamber, a shield shall be erected therein for the protection of the employees.

(2) Shafts shall be subjected to a hydrostatic or air-pressure test, at which pressure they shall be tight. The shaft shall be stamped on the outside shell about 12 inches from each flange to show the pressure to which they have been subjected.

(3) Whenever a shaft is used, it shall be provided, where space permits, with a safe, proper, and suitable staircase for its entire length, including landing platforms, not more than 20 feet apart. Where this is impracticable, suitable ladders shall be installed with landing platforms located about 20 feet apart to break the climb.

(4) All caissons, having a diameter or side greater than 10 feet shall be provided with a man lock and shaft for the exclusive use of employees.

(5) In addition to the gauge in the locks, an accurate gauge shall be maintained on the outer and inner side of each bulkhead. These gauges shall be accessible at all times and kept in accurate working order.

(6) In caisson operations where employees are exposed to compressed air working environments, the requirements contained in WAC 296-155-745 shall be complied with.

[Order 74-26, § 296-155-735, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-740 Cofferdams.** (1) If overtopping of the cofferdam by high waters is possible, means shall be provided for controlled flooding of the work area.

(2) Warning signals for evacuation of employees in case of emergency shall be developed and posted.

(3) Cofferdam walkways, bridges, or ramps with at least two means of rapid exit, shall be provided with guardrails as specified in part K of this chapter.

(4) Manways and ladderways shall be installed separately from the hoistways and partitioned off to prevent hoisted materials from protruding into or falling into manways and/or ladderways.

(5) Pumping equipment shall be located on substantially constructed platforms and where installed in such a position that persons must work below, toe boards shall be installed on the platform.

(6) Cofferdams located close to navigable shipping channels shall be protected from vessels in transit, where possible.

[Order 74-26, § 296-155-740, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-745 Compressed air.** (1) General provisions.

(a) There shall be present, at all times, at least one competent person designated by and representing the employer, who shall be familiar with this part in all respects and responsible for full compliance with these and other applicable parts.

(b) Every employee shall be instructed in the rules and regulations which concern his safety or the safety of others.

(2) Medical attendance, examination, and regulations.

(a) There shall be retained one or more licensed physicians familiar with and experienced in the physical requirements and the medical aspects of compressed air work and the treatment of decompression illness. He shall be available at all times while work is in progress in order to provide medical supervision of employees employed in compressed air work. He shall himself be physically qualified and be willing to enter a pressurized environment.

(b) No employee shall be permitted to enter a compressed air environment until he has been examined by the physician and reported by him to be physically qualified to engage in such work.

(c) In the event an employee is absent from work for 10 days, or is absent due to sickness or injury, he shall not resume work until he is reexamined by the physician, and his physical condition reported, as provided in this subsection, to be such as to permit him to work in compressed air.

(d) After an employee has been employed continuously in compressed air for a period designated by the

physician, but not to exceed 1 year, he shall be reexamined by the physician to determine if he is still physically qualified to engage in compressed air work.

(e) Such physician shall at all times keep a complete and full record of examinations made by him. The physician shall also keep an accurate record of any decompression illness or other illness or injury incapacitating any employee for work, and of all loss of life that occurs in the operation of a tunnel, caisson, or other compartment in which compressed air is used.

(f) Records shall be available for the inspection by the director or his representatives, and a copy thereof shall be forwarded to the division within 48 hours following the occurrence of the accident, death, injury, or decompression illness. It shall state as fully as possible the cause of said death or decompression illness, and the place where the injured or sick employee was taken, and such other relative information as may be required by the director.

(g) A fully equipped first-aid station shall be provided at each tunnel project regardless of the number of persons employed. An ambulance or transportation suitable for a litter case shall be at each project.

(h) Where tunnels are being excavated from portals more than 5 road miles apart, a first-aid station and transportation facilities shall be provided at each portal.

(i) A medical lock shall be established and maintained in immediate working order whenever air pressure in the working chamber is increased above the normal atmosphere.

(j) The medical lock shall:

(i) Have at least 6 feet of clear headroom at the center, and be subdivided into not less than two compartments;

(ii) Be readily accessible to employees working under compressed air;

(iii) Be kept ready for immediate use for at least 5 hours subsequent to the emergence of any employee from the working chamber;

(iv) Be properly heated, lighted and ventilated;

(v) Be maintained in a sanitary condition;

(vi) Have a nonshatterable port through which the occupant(s) may be kept under constant observation;

(vii) Be designed for a working pressure of 75 p.s.i.g.;

(viii) Be equipped with internal controls which may be overridden by external controls;

(ix) Be provided with air pressure gauges to show the air pressure within each compartment to observers inside and outside the medical lock;

(x) Be equipped with a manual type sprinkler system that can be activated inside the lock or by the outside lock tender;

(xi) Be provided with oxygen lines and fittings leading into external tanks. The lines shall be fitted with check valves to prevent reverse flow. The oxygen system inside the chamber shall be of a closed circuit design and be so designed as to automatically shut off the oxygen supply whenever the fire system is activated.

(xii) Be in constant charge of an attendant under the direct control of the retained physician. The attendant

shall be trained in the use of the lock and suitably instructed regarding steps to be taken in the treatment of employee exhibiting symptoms compatible with a diagnosis of decompression illness;

(xiii) Be adjacent to an adequate emergency medical facility;

(xiv) The medical facility shall be equipped with demand-type oxygen inhalation equipment approved by the U.S. Bureau of Mines;

(xv) Be capable of being maintained at a temperature, in use, not to exceed 90°F. nor be less than 70°F.; and

(xvi) Be provided with sources of air, free of oil and carbon monoxide, for normal and emergency use, which are capable of raising the air pressure in the lock from 0 to 75 p.s.i.g. in 5 minutes.

(k) Identification badges shall be furnished to all employees, indicating that the wearer is a compressed air worker. A permanent record shall be kept of all identification badges issued. The badge shall give the employee's name, address of the medical lock, the telephone number of the licensed physician for the compressed air project, and contain instructions that in case of emergency of unknown or doubtful cause or illness, the wearer shall be rushed to the medical lock. The badge shall be worn at all times—off the job, as well as on the job.

(3) Telephone and signal communication. Effective and reliable means of communication, such as bells, whistles, or telephones, shall be maintained at all times between all the following locations;

(a) The working chamber face;

(b) The working chamber side of the man lock near the door;

(c) The interior of the man lock;

(d) Lock attendant's station;

(e) The compressor plant;

(f) The first-aid station;

(g) The emergency lock (if one is required); and

(h) The special decompression chamber (if one is required).

(4) Signs and records.

(a) The time of decompression shall be posted in each man lock as follows:

TIME OF DECOMPRESSION FOR THIS LOCK

----- pounds to ----- pounds in  
----- minutes.  
----- pounds to ----- pounds in  
----- minutes.

(Signed by) -----  
(Superintendent)

This form shall be posted in the man lock at all times.

(b) Any code of signals used shall be conspicuously posted near workplace entrances and such other locations as may be necessary to bring them to the attention of all employees concerned.

(c) For each 8-hour shift, a record of employees employed under air pressure shall be kept by an employee who shall remain outside the lock near the entrance. This record shall show the period each employee spends

in the air chamber and the time taken from decompression. A copy shall be submitted to the appointed physician after each shift.

(5) Compression.

(a) Every employee going under air pressure for the first time shall be instructed on how to avoid excessive discomfort.

(b) During the compression of employees, the pressure shall not be increased to more than 3 p.s.i.g. within the first minute. The pressure shall be held at 3 p.s.i.g. and again at 7 p.s.i.g. sufficiently long to determine if any employees are experiencing discomfort.

(c) After the first minute the pressure shall be raised uniformly and at a rate not to exceed 10 p.s.i. per minute.

(d) If any employee complains of discomfort, the pressure shall be held to determine if the symptoms are relieved. If, after 5 minutes the discomfort does not disappear, the lock attendant shall gradually reduce the pressure until the employee signals that the discomfort has ceased. If he does not indicate that the discomfort has disappeared, the lock attendant shall reduce the pressure to atmospheric and the employee shall be released from the lock.

(e) No employee shall be subjected to pressure exceeding 50 pounds per square inch except in an emergency.

(6) Decompression.

(a) Decompression to normal condition shall be in accordance with the decompression tables in Appendix A of this part.

(b) In the event it is necessary for an employee to be in compressed air more than once in a 24-hour period, the appointed physician shall be responsible for the establishment of methods and procedures of decompression applicable to repetitive exposures.

(c) If decanting is necessary, the appointed physician shall establish procedures before any employee is permitted to be decompressed by decanting methods. The period of time that the employees spend at atmospheric pressure between the decompression following the shift and recompression shall not exceed 5 minutes.

(7) Man locks and special decompression chambers.

(a) Man locks.

(i) Except in emergency, no employees employed in compressed air shall be permitted to pass from the working chamber to atmospheric pressure until after decompression, in accordance with the procedures in this part.

(ii) The lock attendant in charge of a man lock shall be under the direct supervision of the appointed physician. He shall be stationed at the lock controls on the free air side during the period of compression and decompression and shall remain at the lock control station whenever there are persons in the working chamber or in the man lock.

(iii) Except where air pressure in the working chamber is below 12 p.s.i.g., each man lock shall be equipped with automatic controls which, through taped programs, cams, or similar apparatus, shall automatically regulate decompressions. It shall also be equipped with manual

controls to permit the lock attendant to override the automatic mechanism in the event of an emergency, as provided in item (viii) of this subdivision.

(iv) A manual control, which can be used in the event of an emergency, shall be placed inside the man lock.

(v) A clock, thermometer, and continuous recording pressure gauge with a 4-hour graph shall be installed outside of each man lock and shall be changed prior to each shift's decompression. The chart shall be of sufficient size to register a legible record of variations in pressure within the man lock and shall be visible to the lock attendant. A copy of each graph shall be submitted to the appointed physician after each shift. In addition, a pressure gauge, clock, and thermometer shall also be installed in each man lock. Additional fittings shall be provided so that the test gauges may be attached whenever necessary.

(vi) Except where air pressure is below 12 p.s.i.g. and there is no danger of rapid flooding, all caissons having a working area greater than 150 square feet, and each bulkhead in tunnels of 14 feet or more in diameter, or equivalent area, shall have at least two locks in perfect working condition, one of which shall be used exclusively as a man lock, the other, as a materials lock.

(vii) Where only a combination man-and-materials lock is required, this single lock shall be of sufficient capacity to hold the employees constituting two successive shifts.

(viii) Emergency locks shall be large enough to hold an entire heading shift and a limit maintained of 12 p.s.i.g. There shall be a chamber available for oxygen decompression therapy to 28 p.s.i.g.

(ix) The man lock shall be large enough so that those using it are not compelled to be in a cramped position and shall not have less than 5 feet clear head room at the center and a minimum of 30 cubic feet of air space per occupant.

(x) Locks on caissons shall be so located that the bottom door shall be not less than 3 feet above the water level surrounding the caisson on the outside. (The water level, where it is affected by tides, is construed to mean high tide.)

(xi) In addition to the pressure gauge in the locks, an accurate pressure gauge shall be maintained on the outer and inner side of each bulkhead. These gauges shall be accessible at all times and shall be kept in accurate working order.

(xii) Man locks shall have an observation port at least 4 inches in diameter located in such a position that all occupants of the man lock may be observed from the working chamber and from the free air side of the lock.

(xiii) Adequate ventilation in the lock shall be provided.

(xiv) Man locks shall be maintained at a minimum temperature of 70°F.

(xv) When locks are not in use and employees are in the working chamber, lock doors shall be kept open to the working chamber, where practicable.

(xvi) Provision shall be made to allow for rescue parties to enter the tunnel if the working force is disabled.

(xvii) A special decompression chamber of sufficient size to accommodate the entire force of employees being decompressed at the end of a shift shall be provided whenever the regularly established working period requires total time of decompression exceeding 75 minutes.

(b) Special decompression chamber.

(i) The headroom in the special decompression chamber shall be not less than a minimum 7 feet and the cubical content shall provide at least 50 cubic feet of airspace for each employee. For each occupant, there shall be provided 4 square feet of free walking area and 3 square feet of seating space, exclusive of area required for lavatory and toilet facilities. The rated capacity shall be based on the stated minimum space per employee and shall be posted at the chamber entrance. The posted capacity shall not be exceeded, except in case of emergency.

(ii) Each special decompression chamber shall be equipped with the following:

(A) A clock or clocks suitably placed so that the attendant and the chamber occupants can readily ascertain the time;

(B) Pressure gauges which will indicate to the attendants and to the chamber occupants the pressure in the chamber;

(C) Valves to enable the attendant to control the supply and discharge of compressed air into and from the chamber.

(D) Valves and pipes, in connection with the air supply and exhaust, arranged so that the chamber pressure can be controlled from within and without;

(E) Effective means of oral intercommunication between the attendant, occupants of the chamber, and the air compressor plant; and

(F) An observation port at the entrance to permit observation of the chamber occupants.

(iii) Seating facilities in special decompression chambers shall be so arranged as to permit a normal sitting posture without cramping. Seating space, not less than 18 inches by 24 inches wide, shall be provided per occupant.

(iv) Adequate toilet and washing facilities, in a screened or enclosed recess, shall be provided. Toilet bowls shall have a built-in protector on the rim so that an air space is created when the seat lid is closed.

(v) Fresh and pure drinking water shall be available. This may be accomplished by either piping water into the special decompression chamber and providing drinking fountains, or by providing individual canteens, or by some other sanitary means. Community drinking vessels are prohibited.

(vi) No refuse or discarded material of any kind shall be permitted to accumulate, and the chamber shall be kept clean.

(vii) Unless the special decompression chamber is serving as the man lock to atmospheric pressure, the special decompression chamber shall be situated, where practicable, adjacent to the man lock on the atmospheric pressure side of the bulkhead. A passageway shall be provided, connecting the special chamber with the man



lock, to permit employees in the process of decompression to move from the man lock to the special chamber without a reduction in the ambient pressure from that designated for the next stage of decompression. The passageway shall be so arranged as to not interfere with the normal operation of the man lock, nor with the release of the occupants of the special chamber to atmospheric pressure upon the completion of the decompression procedure.

(8) Compressor plant and air supply.

(a) At all times there shall be a thoroughly experienced, competent, and reliable person on duty at the air control valves as a gauge tender who shall regulate the pressure in the working areas. During tunneling operations, one gauge tender may regulate the pressure in not more than two headings: Provided; That the gauges and controls are all in one location. In caisson work, there shall be a gauge tender for each caisson.

(b) The low air compressor plant shall be of sufficient capacity to not only permit the work to be done safely, but shall also provide a margin to meet emergencies and repairs.

(c) Low air compressor units shall have at least two independent and separate sources of power supply and each shall be capable of operating the entire low air plant and its accessory systems.

(d) The capacity, arrangement, and number of compressors shall be sufficient to maintain the necessary pressure without overloading the equipment and to assure maintenance of such pressure in the working chamber during periods of breakdown, repair, or emergency.

(e) Switching from one independent source of power supply to the other shall be done periodically to ensure that workability of the apparatus in an emergency.

(f) Duplicate low-pressure air feedlines and regulating valves shall be provided between the source of air supply and a point beyond the locks with one of the lines extending to within 100 feet of the working face.

(g) All high-pressure and low-pressure air supply lines shall be equipped with check valves.

(h) Low-pressure air shall be regulated automatically. In addition, manually operated valves shall be provided for emergency conditions.

(i) The air intakes for all air compressors shall be located at a place where fumes, exhaust gases, and other air contaminants will be at a minimum.

(j) Gauges indicating the pressure in the working chamber shall be installed in the compressor building, the lock attendant's station, and at the employer's field office.

(9) Ventilation and air quality.

(a) Exhaust valves and exhaust pipes shall be provided and operated so that the working chamber shall be well ventilated, and there shall be no pockets of dead air. Outlets may be required at intermediate points along the main low-pressure air supply line to the heading to eliminate such pockets of dead air. The quantity of ventilation air shall be not less than 30 cubic feet per minute.

(b) The air in the workplace shall be analyzed by the employer not less than once each shift, and records of

such tests shall be kept on file at the place where the work is in progress. The test results shall be within the threshold limit values specified in part B of this chapter, for hazardous gases, and within 10 percent of the lower explosive limit of flammable gases. If these limits are not met, immediate action to correct the situation shall be taken by the employer.

(c) The temperature of all working chambers which are subjected to air pressure shall, by means of after-coolers or other suitable devices, be maintained at a temperature not to exceed 85°F.

(d) Forced ventilation shall be provided during decompression. During the entire decompression period, forced ventilation through chemical or mechanical air purifying devices that will ensure a source of fresh air shall be provided.

(e) Whenever heat-producing machines (moles, shields) are used in compressed air tunnel operations, a positive means of removing the heat build-up at the heading shall be provided.

(10) Electricity.

(a) All lighting in compressed-air chambers shall be by electricity exclusively, and two independent electric-lighting systems with independent sources of supply shall be used. The emergency source shall be arranged to become automatically operative in the event of failure of the regularly used source.

(b) The minimum intensity of light on any walkway, ladder, stairway, or working level shall be not less than 10 foot-candles, and in all workplaces the lighting shall at all times be such as to enable employees to see clearly.

(c) All electrical equipment, and wiring for light and power circuits, shall comply with requirements of Part I, of this standard, for use in damp, hazardous, high temperature, and compressed air environments.

(d) External parts of lighting fixtures and all other electrical equipment, when within 8 feet of the floor, shall be constructed of noncombustible, nonabsorptive, insulating materials, except that metal may be used if it is effectively grounded.

(e) Portable lamps shall be equipped with noncombustible, nonabsorptive, insulating sockets, approved handles, basket guards, and approved cords.

(f) The use of worn or defective portable and pendant conductors is prohibited.

(11) Sanitation.

(a) Sanitary, heated, lighted, and ventilated dressing rooms and drying rooms shall be provided for all employees engaged in compressed air work. Such rooms shall contain suitable benches and lockers. Bathing accommodations (showers at the ratio of one to 10 employees per shift), equipped with running hot and cold water, and suitable and adequate toilet accommodations, shall be provided. One toilet for each 15 employees, or fractional part thereof, shall be provided.

(b) When the toilet bowl is shut by a cover, there should be an air space so that the bowl or bucket does not implode when pressure is increased.

(c) All parts of caissons and other working compartments shall be kept in a sanitary condition.



(12) Fire prevention and protection.

(a) Firefighting equipment shall be available at all times and shall be maintained in working condition.

(b) While welding or flame-cutting is being done in compressed air, a firewatch with a fire hose or approved extinguisher shall stand by until such operation is completed.

(c) Shafts and caissons containing flammable material of any kind, either above or below ground, shall be provided with a waterline and a fire hose connected thereto, so arranged that all points of the shaft or caisson are within reach of the hose stream.

(d) Fire hose shall be at least 1 1/2 inches in nominal diameter; the water pressure shall at all times be adequate for efficient operation of the type of nozzle used; and the water supply shall be such as to ensure an uninterrupted flow. Fire hose, when not in use, shall be located or guarded to prevent injury thereto.

(e) The power house, compressor house, and all buildings housing ventilating equipment, shall be provided with at least one hose connection in the waterline, with a fire hose connected thereto. A fire hose shall be maintained within reach of structures of wood over or near shafts.

(f) Tunnels shall be provided with a 2-inch minimum diameter waterline extending into the working chamber and to within 100 feet of the working face. Such line shall have hose outlets with 100 feet of fire hose attached and maintained as follows: One at the working face; one immediately inside of the bulkhead of the working chamber; and one immediately outside such bulkhead. In addition, hose outlets shall be provided at 200-foot intervals throughout the length of the tunnel, and 100 feet of fire hose shall be attached to the outlet nearest to any location where flammable material is being kept or stored or where any flame is being used.

(g) In addition to fire hose protection required by this part, on every floor of every building not under compressed air, but used in connection with the compressed air work, there shall be provided at least one approved fire extinguisher of the proper type for the hazards involved. At least two approved fire extinguishers shall be provided in the working chamber as follows: One at the working face and one immediately inside the bulkhead (pressure side). Extinguishers in the working chamber shall use water as the primary extinguishing agent and shall not use any extinguishing agent which could be harmful to the employees in the working chamber. The fire extinguisher shall be protected from damage.

(h) Highly combustible materials shall not be used or stored in the working chamber. Wood, paper, and similar combustible material shall not be used in the working chamber in quantities which could cause a fire hazard. The compressor building shall be constructed of noncombustible material.

(i) Man locks shall be equipped with a manual type fire extinguisher system that can be activated inside the man lock and also by the outside lock attendant. In addition, a fire hose and portable fire extinguisher shall be provided inside and outside the man lock. The portable fire extinguisher shall be the dry chemical type.

(j) Equipment, fixtures, and furniture in man locks and special decompression chambers shall be constructed of noncombustible materials. Bedding, etc., shall be chemically treated so as to be fire resistant.

(k) Head frames shall be constructed of structural steel or open frame-work fireproofed timber. Head houses and other temporary surface buildings or structures within 100 feet of the shaft, caisson, or tunnel opening shall be built of fire-resistant materials.

(l) No oil, gasoline, or other combustible materials shall be stored within 100 feet of any shaft, caisson, or tunnel opening, except that oils may be stored in suitable tanks in isolated fireproof buildings, provided such buildings are not less than 50 feet from any shaft, caisson, or tunnel opening, or any building directly connected thereto.

(m) Positive means shall be taken to prevent leaking flammable liquids from flowing into the areas specifically mentioned in the preceding subdivision.

(n) All explosives used in connection with compressed air work shall be selected, stored, transported, and used as specified in part T of this chapter.

(13) Bulkheads and safety screens.

(a) Intermediate bulkheads with locks, or intermediate safety screens or both, are required where there is danger of rapid flooding.

(b) In tunnels 16 feet or more in diameter, hanging walkways shall be provided from the face to the man lock as high in the tunnel as practicable, with at least 6 feet of head room. Walkways shall be constructed of noncombustible material. Standard railings shall be securely installed throughout the length of all walkways on open sides in accordance with part K of this chapter. Where walkways are ramped under safety screens, the walkway surface shall be skidproofed by cleats or by equivalent means.

(c) Bulkheads used to contain compressed air shall be tested, where practicable, to prove their ability to resist the highest air pressure which may be expected to be used.

[Statutory Authority: Chapter 49.17 RCW. 88-23-054 (Order 88-25), § 296-155-745, filed 11/14/88; Order 74-26, § 296-155-745, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-74501 Appendix A--Decompression tables.**

**APPENDIX A--DECOMPRESSION TABLES**

(1) **Explanation.** The decompression tables are computed for working chamber pressures from 0 to 14 pounds, and from 14 to 50 pounds per square inch gauge inclusive by 2-pound increments and for exposure times for each pressure extending from one-half to over 8 hours inclusive. Decompressions will be conducted by two or more stages with a maximum of four stages, the latter for a working chamber pressure of 40 pounds per square inch gauge or over.

Stage 1 consists of a reduction in ambient pressure ranging from 10 to a maximum of 16 pounds per square inch, but in no instance will the pressure be reduced below 4 pounds at the end of stage 1. This reduction in

pressure in stage 1 will always take place at a rate not greater than 5 pounds per minute.

Further reduction in pressure will take place during stage 2 and subsequent stages as required at a slower rate, but in no event at a rate greater than 1 pound per minute.

Decompression Table No. 1 indicates in the body of the table the total decompression time in minutes for various combinations of working chamber pressure and exposure time.

Decompression Table No. 2 indicates for the same various combinations of working chamber pressure and exposure time the following:

- (a) The number of stages required;
- (b) The reduction in pressure and the terminal pressure for each required stage;
- (c) The time in minutes through which the reduction in pressure is accomplished for each required stage;
- (d) The pressure reduction rate in minutes per pound for each required stage;

**IMPORTANT**

**NOTE** The pressure reduction in each stage is accomplished at a uniform rate. Do not interpolate between values shown on the tables. Use the next higher value of working chamber pressure or exposure time should the actual working chamber pressure or the actual exposure time, respectively, fall between those for which calculated values are shown in the body of the tables.

**Examples:**

**Example No. 1:**

4 hours working period at 20 pounds gauge.

**Decompression Table No. 1:**

20 pounds for 4 hours, total decompression time.

43 minutes.

**Decompression Table No. 2:**

**Stage 1:** Reduce pressure from 20 pounds to 4 pounds at the uniform rate of 5 pounds per minute.

Elapsed time stage 1: 16/5-

3 minutes.

**Stage 2 (final stage):** Reduce pressure at a uniform rate from 4 pounds to 0-pound gage over a period of 40 minutes.

Rate—0.10 per pound per minute or 10 minutes per pound.

**Stage 2 (final) elapsed time.**

40 minutes.

**Total time . . . . .** 43 minutes

**Example No. 2:**

5-hour working period at 24 pounds gage.

**Decompression Table No. 1:**

24 pounds for 5 hours, total decompression time.

117 minutes.

**Decompression Table No. 2:**

**Stage 1:** Reduce pressure from 24 pounds to 8 pounds at the uniform rate of 5 pounds per minute.

Elapsed time stage 1: 16/5

3 minutes.

**Stage 2:** Reduce pressure at a uniform rate from 8 pounds to 4 pounds over a period of 4 minutes. Rate, 1 pound per minute elapsed time, stage 2 . . . . . 4 minutes.

Transfer men to special decompression chamber maintaining the 4-pound pressure during the transfer operation.

**Stage 3 (final stage):** In the special decompression chamber, reduce the pressure at a uniform rate from 4 pounds to 0-pound gage over a period of 110 minutes. Rate, 0.037 pound per minute or 27.5 minutes per pound. Stage 3 (final) elapsed time. . .

110 minutes.

**Total time . . . . .** 117 minutes.

**DECOMPRESSION TABLE NO. 1  
TABLE DECOMPRESSION TIME**

	Work pressure										Over 8	
	p.s.i.g. 1/2	1	1 1/2	2	3	4	5	6	7	8		
0-12.....	3	3	3	3	3	3	3	3	3	3	3	3
14.....	6	6	6	6	6	6	6	6	16	16	16	33
16.....	7	7	7	7	7	7	17	33	48	48	48	62
18.....	7	7	7	8	11	17	48	63	63	73	87	87
20.....	7	7	8	15	15	43	63	73	83	103	113	113
22.....	9	9	16	24	38	68	93	103	113	128	133	133
24.....	11	12	23	27	52	92	117	122	127	137	151	151
26.....	13	14	29	34	69	104	126	141	142	142	163	163
28.....	15	23	31	41	98	127	143	153	153	165	183	183
30.....	17	28	38	62	105	143	165	168	178	188	204	204
32.....	19	35	43	85	126	163	178	193	203	213	226	226
34.....	21	39	58	98	151	178	195	218	223	233	248	248
36.....	24	44	63	113	170	198	223	233	243	253	273	273
38.....	28	49	73	128	178	203	223	238	253	263	278	278
40.....	31	49	84	143	183	213	233	248	258	278	288	288
42.....	37	56	102	144	189	215	245	260	263	268	293	293
44.....	43	64	118	154	199	234	254	264	269	269	293	293
46.....	44	74	139	171	214	244	269	274	289	299	318	318
48.....	51	89	144	189	229	269	299	309	319	319	...	...
50.....	58	94	164	209	249	279	309	329	...	...	...	...

DECOMPRESSION TABLE NO. 2

(Do not interpolate, use next higher value for conditions not computed.)

Decompression data							
Working chamber pressure P.s.i.g.	Working period Hours	Stage No.	Pressure reduction P.s.i.g.		Time in stage Minutes	Pressure reduction rate	Total time decompress Minutes
			From	To			
14	1/2	1	14	4	2	0.20	6
		2	4	0	4	1.00	6
	1	1	14	4	2	0.20	6
		2	4	0	4	1.00	6
	1 1/2	1	14	4	2	0.20	6
		2	4	0	4	1.00	6
	2	1	14	4	2	0.20	6
		2	4	0	4	1.00	6
	3	1	14	4	2	0.20	6
		2	4	0	4	1.00	6
	4	1	14	0	2	0.20	6
		2	4	0	4	1.00	6
	5	1	14	4	2	0.20	6
		2	4	0	4	1.00	6
	6	1	14	4	2	0.20	6
		2	4	0	4	1.00	6
	7	1	14	4	2	0.20	6
		2	4	0	14	3.50	16
	8	1	14	4	2	0.20	6
		2	4	0	14	3.50	16
	Over 8	1	14	4	2	0.20	6
		2	4	0	30	7.50	32
16	1/2	1	16	4	3	0.20	7
		2	4	0	4	1.00	7
	1	1	16	4	3	0.20	7
		2	4	0	4	1.00	7
	1 1/2	1	16	4	3	0.20	7
		2	4	0	4	1.00	7
	2	1	16	4	3	0.20	7
		2	4	0	4	1.00	7
	3	1	16	4	3	0.20	7
		2	4	0	4	1.00	7
	4	1	14	4	3	0.20	7
		2	4	0	4	1.00	7
	5	1	14	4	3	0.20	7
		2	4	0	4	3.50	17
	6	1	14	4	3	0.20	7
		2	4	0	30	7.50	33
	7	1	14	4	3	0.20	7
		2	4	0	45	11.25	48
	8	1	14	4	3	0.20	7
		2	4	0	45	11.25	48
	Over 8	1	14	4	3	0.20	7
		2	4	0	60	15.00	63
18	1/2	1	18	4	3	0.20	7
		2	4	0	4	1.00	7
	1	1	18	4	3	0.20	7
		2	4	0	4	1.00	7
	1 1/2	1	18	4	3	0.20	7
		2	4	0	4	1.00	7
	2	1	18	4	3	0.20	7
		2	4	0	5	1.25	8
	3	1	18	4	3	0.20	7
		2	4	0	8	2.00	11
	4	1	18	4	3	0.20	7
		2	4	0	14	3.50	17
	5	1	18	4	3	0.20	7
		2	4	0	45	11.25	48
	6	1	18	4	3	0.20	7
		2	4	0	60	15.00	63
	7	1	18	4	3	0.20	7
		2	4	0	60	15.00	63

DECOMPRESSION TABLE NO. 2--cont.

Decompression data							
Working chamber pressure P.s.i.g.	Working period Hours	Stage No.	Pressure reduction P.s.i.g.		Time in stage Minutes	Pressure reduction rate	Total time decompress Minutes
			From	To			
	8	1	18	4	3	0.20	
		2	4	0	70	17.50	73
	Over 8	1	18	4	3	0.20	
		2	4	0	84	21.00	87
20	1/2	1	20	4	3	0.20	
		2	4	0	4	1.00	7
	1	1	20	4	3	0.20	
		2	4	0	4	1.00	7
	1 1/2	1	20	4	3	0.20	
		2	4	0	5	1.25	8
	2	1	20	4	3	0.20	
		2	4	0	12	3.00	15
	3	1	20	4	3	0.20	
		2	4	0	12	3.00	15
	4	1	20	4	3	0.20	
		2	4	0	40	10.00	43
	5	1	20	4	3	0.20	
		2	4	0	60	15.00	63
	6	1	20	4	3	0.20	
		2	4	0	70	17.50	73
	7	1	20	4	3	0.20	
		2	4	0	80	20.00	83
	8	1	20	4	3	0.20	
		2	4	0	100	25.00	103
	Over 8	1	20	4	3	0.20	
		2	4	0	110	27.50	113
22	1/2	1	22	6	3	0.20	
		2	6	0	6	1.00	9
	1	1	22	6	3	0.20	
		2	6	0	6	1.00	9
	1 1/2	1	22	6	3	0.20	
		2	6	0	13	2.20	16
	2	1	22	6	3	0.20	
		2	6	0	21	3.50	24
	3	1	22	6	3	0.20	
		2	6	0	35	5.85	38
	4	1	22	6	3	0.20	
		2	6	0	65	10.83	68
	5	1	22	6	3	0.20	
		2	6	0	90	15.00	93
	6	1	22	6	3	0.20	
		2	6	0	100	16.67	103
	7	1	22	6	3	0.20	
		2	6	0	110	18.35	113
	8	1	22	6	3	0.20	
		2	6	0	125	20.80	128
	Over 8	1	22	6	3	0.20	
		2	6	0	130	21.70	133
24	1/2	1	24	8	3	0.20	
		2	8	4	4	1.00	
		3	4	0	4	1.00	11
	1	1	24	8	3	0.20	
		2	8	4	4	1.00	
		3	4	0	5	1.25	12
	1 1/2	1	24	8	3	0.20	
		2	8	4	4	1.00	
		3	4	0	16	4.00	23
	2	1	24	8	3	0.20	
		2	8	4	4	1.00	
		3	4	0	20	5.00	27
	3	1	24	8	3	0.20	
		2	8	4	4	1.00	
		3	4	0	45	11.25	52
	4	1	24	8	3	0.20	
		2	8	4	4	1.00	
		3	4	0	85	21.25	92

DECOMPRESSION TABLE NO. 2--cont.

Working chamber pressure P.s.i.g.	Working period Hours	Stage No.	Pressure reduction P.s.i.g.		Time in stage Minutes	Pressure reduction rate	Total time decompress Minutes
			From	To			
			Min/Pound				
5	.....	1	24	8	3	0.20	117
		2	8	4	4	1.00	
		3	4	0	110	27.50	
6	.....	1	24	8	3	0.20	122
		2	8	4	4	1.00	
		3	4	0	115	28.80	
7	.....	1	24	8	3	0.20	127
		2	8	4	4	1.00	
		3	4	0	120	30.00	
8	.....	1	24	8	3	0.20	137
		2	8	4	4	1.00	
		3	4	0	130	32.50	
Over 8	.	1	24	8	3	0.20	151
		2	8	4	8	2.00	
		3	4	0	140	35.00	
26	..... 1/2	1	26	10	3	0.20	13
		2	10	4	6	1.00	
		3	4	0	4	1.00	
1	.....	1	26	10	3	0.20	14
		2	10	4	6	1.00	
		3	4	0	5	1.25	
1 1/2	..	1	26	10	3	0.20	29
		2	10	4	6	1.00	
		3	4	0	20	5.00	
2	.....	1	26	10	3	0.20	34
		2	10	4	6	1.00	
		3	4	0	25	6.25	
3	.....	1	26	10	3	0.20	69
		2	10	4	6	1.00	
		3	4	0	60	15.00	
4	.....	1	26	10	3	0.20	104
		2	10	4	6	1.00	
		3	4	0	95	23.75	
5	.....	1	26	10	3	0.20	126
		2	10	4	8	1.33	
		3	4	0	115	28.80	
6	.....	1	26	10	3	0.20	141
		2	10	4	8	1.33	
		3	4	0	130	32.50	
7	.....	1	26	10	3	0.20	142
		2	10	4	9	1.50	
		3	4	0	130	32.50	
8	.....	1	26	10	3	0.20	142
		2	10	4	9	1.50	
		3	4	0	130	32.50	
Over 8	.	1	26	10	3	0.20	163
		2	10	4	30	5.00	
		3	4	0	130	32.50	
28	..... 1/2	1	28	12	3	0.20	15
		2	12	4	8	1.00	
		3	4	0	4	1.00	
1	.....	1	28	12	3	0.20	23
		2	12	4	8	1.00	
		3	4	0	12	3.00	
1 1/2	..	1	28	12	3	0.20	31
		2	12	4	8	1.00	
		3	4	0	20	5.00	
2	.....	1	28	12	3	0.20	41
		2	12	4	8	1.00	
		3	4	0	30	7.50	
3	.....	1	28	12	3	0.20	98
		2	12	4	10	1.25	
		3	4	0	85	21.20	
4	.....	1	28	12	3	0.20	127
		2	12	4	14	1.75	
		3	4	0	110	27.50	

DECOMPRESSION TABLE NO. 2--cont.

Working chamber pressure P.s.i.g.	Working period Hours	Stage No.	Pressure reduction P.s.i.g.		Time in stage Minutes	Pressure reduction rate	Total time decompress Minutes
			From	To			
			Min/Pound				
5	.....	1	28	12	3	0.20	143
		2	12	4	20	2.50	
		3	4	0	120	30.00	
6	.....	1	28	12	3	0.20	153
		2	12	4	20	2.50	
		3	4	0	130	32.50	
7	.....	1	28	12	3	0.20	153
		2	12	4	20	2.50	
		3	4	0	130	32.50	
8	.....	1	28	12	3	0.20	165
		2	12	4	32	4.00	
		3	4	0	130	32.50	
Over 8	.	1	28	12	3	0.20	183
		2	12	4	50	6.25	
		3	4	0	130	32.50	
30	..... 1/2	1	30	14	3	0.20	17
		2	14	4	10	1.00	
		3	4	0	4	1.00	
1	.....	1	30	14	3	0.20	28
		2	14	4	10	1.00	
		3	4	0	15	3.75	
1 1/2	..	1	30	14	3	0.20	38
		2	14	4	10	1.00	
		3	4	0	25	6.25	
2	.....	1	30	14	3	0.20	62
		2	14	4	14	1.40	
		3	4	0	45	11.25	
3	.....	1	30	14	3	0.20	105
		2	14	4	17	1.70	
		3	4	0	85	21.20	
4	.....	1	30	14	3	0.20	143
		2	14	4	30	3.00	
		3	4	0	110	27.50	
5	.....	1	30	14	3	0.20	165
		2	14	4	35	3.50	
		3	4	0	130	32.50	
6	.....	1	30	14	3	0.20	168
		2	14	4	35	3.50	
		3	4	0	130	32.50	
7	.....	1	30	14	3	0.20	178
		2	14	4	45	4.50	
		3	4	0	130	32.50	
8	.....	1	30	14	3	0.20	188
		2	14	4	55	5.50	
		3	4	0	130	32.50	
Over 8	.	1	30	14	3	0.20	204
		2	14	4	71	7.10	
		3	4	0	130	32.50	
32	..... 1/2	1	32	16	3	0.20	19
		2	16	4	12	1.00	
		3	4	0	4	1.00	
1	.....	1	32	16	3	0.20	35
		2	16	4	12	1.00	
		3	4	0	20	5.00	
1 1/2	..	1	32	16	3	0.20	43
		2	16	4	15	1.25	
		3	4	0	25	6.25	
2	.....	1	32	16	3	0.20	85
		2	16	4	22	1.83	
		3	4	0	60	15.00	
3	.....	1	32	16	3	0.20	126
		2	16	4	28	2.33	
		3	4	0	95	23.75	
4	.....	1	32	16	3	0.20	163
		2	16	4	40	3.33	
		3	4	0	120	30.00	

DECOMPRESSION TABLE NO. 2--cont.

DECOMPRESSION TABLE NO. 2--cont.

Working chamber pressure P.s.i.g.	Working period Hours	Stage No.	Decompression data				Total time decompress Minutes
			Pressure reduction P.s.i.g.		Time in stage Minutes	Pressure reduction rate	
			From	To			
5	.....	1	32	16	3	0.20	
		2	16	4	45	3.75	
		3	4	0	130	32.50	178
6	.....	1	32	16	3	0.20	
		2	16	4	60	5.00	
		3	4	0	130	32.50	193
7	.....	1	32	16	3	0.20	
		2	16	4	70	5.83	
		3	4	0	130	32.50	203
8	.....	1	32	16	3	0.20	
		2	16	4	80	6.67	
		3	4	0	130	32.50	213
Over 8 .		1	32	16	3	0.20	
		2	16	4	93	7.75	
		3	4	0	130	32.50	226
34	.... 1/2 ...	1	34	18	3	0.20	
		2	18	4	14	1.00	
		3	4	0	4	1.00	21
1	.....	1	34	18	3	0.20	
		2	18	4	14	1.00	
		3	4	0	22	5.50	39
1 1/2 ..		1	34	18	3	0.20	
		2	18	4	25	1.80	
		3	4	0	30	7.50	58
2	.....	1	34	18	3	0.20	
		2	18	4	35	2.50	
		3	4	0	60	15.00	98
3	.....	1	34	18	3	0.20	
		2	18	4	43	3.10	
		3	4	0	105	26.25	151
4	.....	1	34	18	3	0.20	
		2	18	4	55	3.93	
		3	4	0	120	30.00	178
5	.....	1	34	18	3	0.20	
		2	18	4	62	4.43	
		3	4	0	130	32.50	195
6	.....	1	34	18	3	0.20	
		2	18	4	85	6.07	
		3	4	0	130	32.50	218
7	.....	1	34	18	3	0.20	
		2	18	4	90	6.43	
		3	4	0	130	32.50	223
8	.....	1	34	18	3	0.20	
		2	18	4	100	7.15	
		3	4	0	130	32.50	233
Over 8 .		1	34	18	3	0.20	
		2	18	4	115	8.23	
		3	4	0	130	32.50	248
36	.... 1/2 ...	1	36	20	3	0.20	
		2	20	4	16	1.00	
		3	4	0	5	1.25	24
1	.....	1	36	20	3	0.20	
		2	20	4	16	1.00	
		3	4	0	25	6.25	44
1 1/2 ..		1	36	20	3	0.20	
		2	20	4	30	1.88	
		3	4	0	30	7.50	63
2	.....	1	36	20	3	0.20	
		2	20	4	40	2.50	
		3	4	0	70	17.50	113
3	.....	1	36	20	3	0.20	
		2	20	4	52	3.25	
		3	4	0	115	28.75	170
4	.....	1	36	20	3	0.20	
		2	20	4	65	4.06	
		3	4	0	130	32.50	198

Working chamber pressure P.s.i.g.	Working period Hours	Stage No.	Decompression data				Total time decompress Minutes
			Pressure reduction P.s.i.g.		Time in stage Minutes	Pressure reduction rate	
			From	To			
5	.....	1	36	20	3	0.20	
		2	20	4	90	5.63	
		3	4	0	130	32.50	223
6	.....	1	36	20	3	0.20	
		2	20	4	100	6.25	
		3	4	0	130	32.50	233
7	.....	1	36	20	3	0.20	
		2	20	4	110	6.88	
		3	4	0	130	32.50	243
8	.....	1	36	20	3	0.20	
		2	20	4	120	7.50	
		3	4	0	130	32.50	253
Over 8 .		1	36	20	3	0.20	
		2	20	4	140	8.75	
		3	4	0	130	32.50	273
38	.... 1/2 ...	1	38	22	3	0.20	
		2	22	6	16	1.00	
		3	6	0	9	1.50	28
1	.....	1	38	22	3	0.20	
		2	22	6	16	1.00	
		3	6	0	30	5.00	49
1 1/2 ..		1	38	22	3	0.20	
		2	22	6	20	1.25	
		3	6	0	50	8.34	73
2	.....	1	38	22	3	0.20	
		2	22	6	30	1.88	
		3	6	0	95	15.83	128
3	.....	1	38	22	3	0.20	
		2	22	6	35	2.19	
		3	6	0	140	23.35	178
4	.....	1	38	22	3	0.20	
		2	22	6	50	3.12	
		3	6	0	150	25.00	203
5	.....	1	38	22	3	0.20	
		2	22	6	55	3.44	
		3	6	0	165	27.50	223
6	.....	1	28	22	3	0.20	
		2	22	6	70	4.38	
		3	6	0	165	27.50	238
7	.....	1	38	22	3	0.20	
		2	22	6	85	5.32	
		3	6	0	165	27.50	253
8	.....	1	38	22	3	0.20	
		2	22	6	95	5.93	
		3	6	0	165	27.50	263
Over 8 .		1	38	22	3	0.20	
		2	22	6	110	6.88	
		3	6	0	165	27.50	278
40	.... 1/2 ...	1	40	24	3	0.20	
		2	24	8	16	1.00	
		3	8	4	4	1.00	
		4	4	0	8	2.00	31
1	.....	1	40	24	3	0.20	
		2	24	8	16	1.00	
		3	8	4	5	1.25	
		4	4	0	25	6.25	49
1 1/2 ..		1	40	24	3	0.20	
		2	24	8	16	1.00	
		3	8	4	20	5.00	
		4	4	0	45	11.25	84
2	.....	1	40	24	3	0.20	
		2	24	8	25	1.56	
		3	8	4	20	5.00	
		4	4	0	95	23.75	143

DECOMPRESSION TABLE NO. 2--cont.

Working chamber pressure P.s.i.g.	Working period Hours	Stage No.	Pressure reduction P.s.i.g.		Time in stage Minutes	Pressure reduction rate	Total time decompress Minutes
			From	To			
			Min/Pound				
3	.....	1	40	24	3	0.20	183
		2	24	8	30	1.88	
		3	8	4	30	7.50	
		4	4	0	120	30.00	
4	.....	1	40	24	3	0.20	213
		2	24	8	45	2.81	
		3	8	4	35	8.75	
		4	4	0	130	32.50	
5	.....	1	40	24	3	0.20	233
		2	24	8	47	2.94	
		3	8	4	53	13.25	
		4	4	0	130	32.50	
6	.....	1	40	24	3	0.20	248
		2	24	8	55	3.44	
		3	8	4	60	15.00	
		4	4	0	130	32.50	
7	.....	1	40	24	3	0.20	258
		2	24	8	65	4.06	
		3	8	4	60	15.00	
		4	4	0	130	32.50	
8	.....	1	40	24	3	0.20	268
		2	24	8	75	4.70	
		3	8	4	60	15.00	
		4	4	0	130	32.50	
Over 8	.....	1	40	24	3	0.20	288
		2	24	8	95	5.93	
		3	8	4	60	15.00	
		4	4	0	130	32.50	
42	..... 1/2	1	42	26	3	0.20	37
		2	26	10	16	1.00	
		3	10	4	6	1.00	
		4	4	0	12	3.00	
1	.....	1	42	26	3	0.20	56
		2	26	10	16	1.00	
		3	10	4	12	2.00	
		4	4	0	25	6.25	
1 1/2	.....	1	42	26	3	0.20	102
		2	26	10	16	1.00	
		3	10	4	23	3.83	
		4	4	0	60	15.00	
2	.....	1	42	26	3	0.20	144
		2	26	10	16	1.00	
		3	10	4	30	5.00	
		4	4	0	95	23.75	
3	.....	1	42	26	3	0.20	189
		2	26	10	16	1.00	
		3	10	4	50	8.34	
		4	4	0	120	30.00	
4	.....	1	42	26	3	0.20	215
		2	26	10	17	1.06	
		3	10	4	65	10.83	
		4	4	0	130	32.50	
5	.....	1	42	26	3	0.20	245
		2	26	10	27	1.69	
		3	10	4	85	14.18	
		4	4	0	130	32.50	
6	.....	1	42	26	3	0.20	260
		2	26	10	27	1.69	
		3	10	4	100	16.67	
		4	4	0	130	32.50	
7	.....	1	42	26	3	0.20	263
		2	26	10	30	1.88	
		3	10	4	100	16.67	
		4	4	0	130	32.50	

DECOMPRESSION TABLE NO. 2--cont.

Working chamber pressure P.s.i.g.	Working period Hours	Stage No.	Pressure reduction P.s.i.g.		Time in stage Minutes	Pressure reduction rate	Total time decompress Minutes
			From	To			
			Min/Pound				
8	.....	1	42	26	3	0.20	268
		2	26	10	35	2.19	
		3	10	4	100	16.67	
		4	4	0	130	32.50	
Over 8	.....	1	42	26	3	0.20	293
		2	26	10	60	3.75	
		3	10	4	100	16.67	
		4	4	0	130	32.50	
44	..... 1/2	1	44	28	3	0.20	43
		2	28	12	16	1.00	
		3	12	4	8	1.00	
		4	4	0	16	4.00	
1	.....	1	44	28	3	0.20	64
		2	28	12	16	1.00	
		3	12	4	20	2.50	
		4	4	0	25	6.25	
1 1/2	.....	1	44	28	3	0.20	118
		2	28	12	16	1.00	
		3	12	4	27	3.38	
		4	4	0	72	18.00	
2	.....	1	44	28	3	0.20	154
		2	28	12	16	1.00	
		3	12	4	40	5.00	
		4	4	0	95	23.75	
3	.....	1	44	28	3	0.20	199
		2	28	12	16	1.00	
		3	12	4	60	7.50	
		4	4	0	120	30.00	
4	.....	1	44	28	3	0.20	234
		2	28	12	16	1.00	
		3	12	4	85	10.62	
		4	4	0	130	32.50	
5	.....	1	44	28	3	0.20	254
		2	28	12	16	1.00	
		3	12	4	105	13.13	
		4	4	0	130	32.50	
6	.....	1	44	28	3	0.20	264
		2	28	12	16	1.00	
		3	12	4	115	14.38	
		4	4	0	130	32.50	
7	.....	1	44	28	3	0.20	269
		2	28	12	16	1.00	
		3	12	4	120	15.00	
		4	4	0	130	32.50	
8	.....	1	44	28	3	0.20	269
		2	28	12	16	1.00	
		3	12	4	120	15.00	
		4	4	0	130	32.50	
Over 8	.....	1	44	28	3	0.20	293
		2	28	12	40	2.50	
		3	12	4	120	15.00	
		4	4	0	130	32.50	
46	..... 1/2	1	46	30	3	0.20	44
		2	30	14	16	1.00	
		3	14	4	10	1.00	
		4	4	0	15	3.75	
1	.....	1	46	30	3	0.20	74
		2	30	14	16	1.00	
		3	14	4	25	2.50	
		4	4	0	30	7.50	
1 1/2	.....	1	46	30	3	0.20	139
		2	30	14	16	1.00	
		3	14	4	35	3.50	
		4	4	0	85	21.20	

DECOMPRESSION TABLE NO. 2--cont.

DECOMPRESSION TABLE NO. 2--cont.

Working chamber pressure P.s.i.g.	Working period Hours	Stage No.	Pressure reduction P.s.i.g.		Time in stage Minutes	Pressure reduction rate	Total time decompress Minutes
			From	To			
			Min/Pound				
2	.....	1	46	30	3	0.20	
		2	30	14	16	1.00	
		3	14	4	47	4.70	
		4	4	0	105	26.25	171
3	.....	1	46	30	3	0.20	
		2	30	14	16	1.00	
		3	14	4	65	6.50	
		4	4	0	130	32.50	214
4	.....	1	46	30	3	0.20	
		2	30	14	16	1.00	
		3	14	4	95	9.50	
		4	4	0	130	32.50	244
5	.....	1	46	30	3	0.20	
		2	30	14	16	1.00	
		3	14	4	120	12.00	
		4	4	0	130	32.50	269
6	.....	1	46	30	3	0.20	
		2	30	14	16	1.00	
		3	14	4	125	12.50	
		4	4	0	130	32.50	274
7	.....	1	46	30	3	0.20	
		2	30	14	16	1.00	
		3	14	4	140	14.00	
		4	4	0	130	32.50	289
8	.....	1	46	30	3	0.20	
		2	30	14	16	1.00	
		3	14	4	150	15.00	
		4	4	0	130	32.50	299
Over 8		1	46	30	3	0.20	
		2	30	14	25	1.56	
		3	14	4	160	16.00	
		4	4	0	130	32.50	318
48	..... 1/2	1	48	32	3	0.20	
		2	32	16	16	1.00	
		3	16	4	12	1.00	
		4	4	0	20	5.00	51
1	.....	1	48	32	3	0.20	
		2	32	16	16	1.00	
		3	16	4	35	2.92	
		4	4	0	35	8.75	89
1 1/2	..	1	48	32	3	0.20	
		2	32	16	16	1.00	
		3	16	4	45	3.75	
		4	4	0	80	20.00	144
2	.....	1	48	32	3	0.20	
		2	32	16	16	1.00	
		3	16	4	60	5.00	
		4	4	0	110	27.50	189
3	.....	1	48	32	3	0.20	
		2	32	16	16	1.00	
		3	16	4	90	7.50	
		4	4	0	120	30.00	229
4	.....	1	48	32	3	0.20	
		2	32	16	16	1.00	
		3	16	4	120	10.00	
		4	4	0	130	32.50	269
5	.....	1	48	32	3	0.20	
		2	32	16	16	1.00	
		3	16	4	140	11.67	
		4	4	0	130	32.50	299
6	.....	1	48	32	3	0.20	
		2	32	16	16	1.00	
		3	16	4	160	13.33	
		4	4	0	130	32.50	309

Working chamber pressure P.s.i.g.	Working period Hours	Stage No.	Pressure reduction P.s.i.g.		Time in stage Minutes	Pressure reduction rate	Total time decompress Minutes
			From	To			
			Min/Pound				
7	.....	1	48	32	3	0.20	
		2	32	16	16	1.00	
		3	16	4	170	14.17	
		4	4	0	130	32.50	319
8	.....	1	48	32	3	0.20	
		2	32	16	16	1.00	
		3	16	4	170	14.17	
		4	4	0	130	32.50	319
50	..... 1/2	1	50	34	3	0.20	
		2	34	18	16	1.00	
		3	18	4	14	1.00	
		4	4	0	25	6.25	58
1	.....	1	50	34	3	0.20	
		2	34	18	16	1.00	
		3	18	4	40	2.86	
		4	4	0	35	8.75	94
1 1/2	..	1	50	34	3	0.20	
		2	34	18	16	1.00	
		3	18	4	55	3.93	
		4	4	0	90	22.50	164
2	.....	1	50	34	3	0.20	
		2	34	18	16	1.00	
		3	18	4	70	5.00	
		4	4	0	120	30.00	209
3	.....	1	50	34	3	0.20	
		2	34	18	16	1.00	
		3	18	4	100	7.15	
		4	4	0	130	32.50	249
4	.....	1	50	34	3	0.20	
		2	34	18	16	1.00	
		3	18	4	130	8.58	
		4	4	0	130	32.50	279
5	.....	1	50	34	3	0.20	
		2	34	18	16	1.00	
		3	18	4	160	11.42	
		4	4	0	130	32.50	309
6	.....	1	50	34	3	0.20	
		2	34	18	16	1.00	
		3	18	4	180	12.85	
		4	4	0	130	32.50	329

[Order 74-26, § 296-155-745 (part), Appendix A (codified as WAC 296-155-74501), filed 5/7/74, effective 6/6/74.]

**Part R**  
**MISCELLANEOUS CONSTRUCTION REQUIREMENTS**

- WAC  
 296-155-755 Roofing, insulating and waterproofing.  
 296-155-765 Rock crushing, gravel washing, and hot mix plants.  
 296-155-770 Moving of structures.

**DISPOSITION OF SECTIONS FORMERLY CODIFIED IN THIS SUBCHAPTER**

- 296-155-750 Masonry construction. [Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-750, filed 1/21/86; Order 74-26, § 296-155-750, filed 5/7/74, effective 6/6/74.] Repealed by 89-11-035 (Order 89-03), filed 5/15/89, effective 6/30/89. Statutory Authority: Chapter 49.17 RCW.  
 296-155-760 Concrete finishing. [Order 74-26, § 296-155-760, filed 5/7/74, effective 6/6/74.] Repealed by 86-03-



074 (Order 86-14), filed 1/21/86. Statutory Authority: RCW 49.17.040 and 49.17.050.

**WAC 296-155-755 Roofing, insulating and water-proofing.** (1) Roofers hoisting jack shall be constructed to withstand the contemplated load to be hoisted. The beam from counter balance point to heel of jack shall be at least 3/4 the length of the entire beam.

(2) Hoisting jack shall be counterweighted with a minimum of three times the contemplated maximum load to be lifted. Counterweight shall be securely fastened to heel of jack to prevent displacement, or the jack shall be fastened by means of lashing, bolting, or other means to prevent displacement.

(3) A steel collar or U-bolt and shackle on head of the hoisting jack shall be provided for attachment of pulley.

(4) Hoisting pulleys shall be of steel construction.

(5) Where materials are hoisted by hand the hoist line shall be not less than five-eighths manila rope, or the equivalent. Where machine hoist is used the hoist line shall be wire rope.

(6) Hoisting hooks shall be of cast or forged steel heavy enough to prevent straightening under a load.

(7) Workers shall not stand under load when material or hot asphalt is being hoisted.

(8) Hot asphalt shall be kept at a safe level in buckets for carrying and hoisting.

(9) Service buckets of hot asphalt shall not be carried up ladders by workers.

(10) Service buckets shall be standard safety bucket or flatbottom bucket with bails fastened to an offset ear firmly riveted to side of bucket. There shall be a handle riveted near bottom of bucket for tipping purposes.

(11) Ladders shall extend at least 3 feet above the platform or roof served and shall be secured at top and bottom to prevent slipping.

(12) Safeguards shall be erected to prevent loads and lines contacting power lines where not possible to work in clear of power lines.

(13) Asphalt chunks shall not be thrown into hot tar pot, but shall be placed so as to prevent splashing of hot material.

(14) There shall be means to smother fires at fired tar pots.

(15) Mop or spud bar handles over three feet long shall be of wood or other nonconductive material.

(16) Persons working at kettles or handling hot tar shall, wear gloves and have arms fully protected.

(17) Open tar heating pots shall be kept outside of buildings.

Note: Electric type tar heating equipment may be used inside of the working enclosure provided that exhaust fans in connection with tubing, either rigid or flexible, capable of carrying fumes created by the heating process to the outside air are installed and in constant use during heating operations. The equipment should be provided with hinged lid or baffle plate for the purpose of immediate smothering of a pot fire.

(18) While hot tar is being applied inside an enclosure, exhaust fans to supplement natural ventilation shall be installed to expedite removal of gaseous fumes from the building.

(19) Flame heated tar pots shall be prohibited on roofs of structures.

(20) Tar pots shall have an attendant at all times while in operation.

[Order 74-26, § 296-155-755, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-765 Rock crushing, gravel washing, and hot mix plants.** (1) Stationary dragline machines shall have all moving parts which are exposed to contact guarded with standard safeguards.

(a) All running lines, straps, etc., shall be regularly inspected and shall be changed when 10% of the wires in a 3 foot length are broken.

(b) Spars shall be properly guyed with a minimum of 5 top guys and where spar is over 50 feet in height, 3 buckle guys shall be used.

(c) A pass line shall be rigged on the spar to provide safe means of reaching top of spar.

(d) The head block shall be equipped with a safety strap attached to shell of the block and onto a guy wire leading away from the working area.

(2) Truck dump bunkers shall have wheel bumper block installed when dumping material from trucks.

(3) Substantial walkways and working platforms, equipped with toe boards and handrails shall be installed at all plants. Standard stairways and ladders shall be placed to reach all parts requiring oiling and maintenance.

(4) Plant structures shall be constructed to carry the required load, without material or structural failure, for the prescribed life of the material used.

(5) Bunker unloading devices shall be arranged to be operative from outside the walls of bunkers.

(6) Crusher operators and other employees working where hazardous dust or nuisance dust exists shall use approved respirators and goggles.

(7) All dusty rock crushing houses or other dusty places of employment, shall be equipped with means for controlling the dust.

(8) Cone type crushers shall be equipped with approved guards over or around the feed end to prevent rock from flying from crusher while in operation.

(9) All aggregate elevators, bucket or other type, shall have guards or barricades installed under or around return strand and of sufficient strength to sustain weight of piled up broken elevator equipment.

(10) All plant controls shall be placed so as to be readily accessible.

(11) Overhead conveyors shall be constructed so as to restrain the spillage of material. Wherever the hazard of falling materials exists, overhead protection shall be provided over walkways and roadways.

(12) Electrical equipment shall be installed and maintained to comply with the National Electrical Code.

(13) Exhaust fumes from internal combustion engines shall be discharged away from or above the working station.

(14) Hot mix plants, steam boilers and pressure vessels shall conform to A.S.M.E. Boiler and Pressure Vessel Codes and applicable rules and regulations of the department.

(15) All hot pipes exposed to contact shall be covered or otherwise guarded against contact.

(16) All oil tanks above ground shall be properly bedded and grounded.

(17) Oil leakage on the ground shall be cleaned up or covered with absorbent material.

(18) Mixer operators shall use approved respirator and goggles except when operating from a remote location.

(19) Dust and fume collection systems shall be provided on all installations. Dust and fumes shall be discharged back into plant or carried to a suitable distance from the work area and precipitated.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-765, filed 1/21/86; Order 74-26, § 296-155-765, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-770 Moving of structures.** (1) When structures are being raised, lowered, temporarily held in position or moved laterally, care shall be exercised to prevent the possibility of mishap.

(2) Weights to be moved shall be carefully computed and equipment furnished to provide a safety factor of five.

(3) Where excavations exist they shall be shored in compliance with Part N of this chapter.

(4) Cribbing and blocking shall be set on a level and firm foundation.

(5) Dollies and rollers shall be securely blocked except when structure is being moved by power equipment.

(6) Jacks shall comply with WAC 296-155-375 of this chapter.

(7) Provisions shall be made to maintain a minimum clearance of 10 feet from all electrical conductors with the following exceptions:

(a) When a representative of the owner of the electrical conductors is present and directs the handling of all said conductors.

(b) Where there shall be existing and/or erected mechanical barriers to prevent contact of structure or workers with said electrical conductors. Barriers shall be installed by or under the direction of the owners of the conductors.

(c) Where said electrical conductors have been de-energized and grounded by the owners of the conductors.

(d) By relocation of said electrical conductors by the owners of the conductors. The 10 foot requirement shall not be reduced by movement due to strains being imposed upon the conductors or the structures supporting the conductors or upon any fixtures or attachments thereon.

(8) When a structure is being lifted, shoring shall be provided at all times and be kept up to the object until the desired height is reached, and then it shall be blocked or cribbed immediately.

(9) Timbers must be in sound condition and of a size sufficient to maintain not more than one inch deflection for each 200 inches of unsupported span.

(10) The cross member used on the front dolly, or the fifth wheel on the truck, must be of construction and size to preclude any deflection. All floor joists of the

building being moved must be firmly supported on either the running members or on the cross members, which in turn ride on or are firmly attached to the running members.

(11) When timbers are used as the cross member, a steel saddle or cradle shall be used which will distribute the load evenly over the cross members, which in turn ride on or are firmly attached to the running members.

(12) When timbers are used as the cross member, a steel saddle or cradle shall be used which will distribute the load evenly over the cross sectional area of said timber where the timber is supported over the dolly or fifth wheel. This saddle or cradle shall be equipped so as to be interchangeable on any standard fifth wheel when such operation is used. Cross members of any other material used on fifth wheel loading shall also be so equipped.

(13) When running members are secured to the lower side of the cross member supported by the fifth wheel or front dolly, the primary support shall be 3/4 inch steel bolts placed one on either side of each member and spaced from such members by 1/2 inch steel plate shaped to act as a template for placement on the top of the cross member and beneath the running member. 3/4 by 3" nuts shall be used to tighten the above described clamp in a secure fashion. A secondary binding of chain or cable with chain binder or jacks shall be used to securely fasten the running members to cross members.

Note: Chains or cables securely tightened can be used. A secondary chain or safety chain should also be used in the event that the main chain should snap.

(14) Safety chains shall be used between the running members and the towing truck to supplant the tow bar, and will be secured so as to preclude any possibility of the running timbers being pulled off the cross members on the truck or from the dollies.

(15) For the purpose of computing weights to determine the axle and tire loadings, the cubic volume of the building (length, width and height), including walls, floors and ceiling joists, shall be used, allowing five pounds per cubic foot. This method of computing weight shall be used to determine if larger equipment need be employed on any given move.

(16) When fastening structures to tractor, and runners are clamped to headers, steel chains or the equivalent shall be used. If steel chains are used, said chains shall be tightened by railroad jacks or the equivalent.

(17) All motor vehicles shall conform with motor vehicle laws of the state of Washington.

(18) A fifth wheel type suspension with two nonsteering dollies shall be acceptable for moving buildings which do not exceed 46 feet in length. Permission to move larger structures with this type of suspension shall be obtained from the department.

(19) Pushing from the rear shall be prohibited unless a system of signals is used to control the driver.

(20) Blocks capable of holding the unit being moved shall be carried, and in case of winching operations, shall be kept close to the downhill side of the wheel of each dolly to prevent a runaway should the cable slip.

[Order 74-26, § 296-155-770, filed 5/7/74, effective 6/6/74.]

**Part S**  
**DEMOLITION**

**WAC**

296-155-775	Preparatory operations.
296-155-780	Stairs, passageways, and ladders.
296-155-785	Chutes.
296-155-790	Removal of materials through floor openings.
296-155-795	Removal of walls, masonry sections, and chimneys.
296-155-800	Manual removal of floors.
296-155-805	Removal of walls, floors, and material with equipment.
296-155-810	Catch platforms.
296-155-815	Storage.
296-155-820	Removal of steel construction.
296-155-825	Mechanical demolition.
296-155-830	Selective demolition by explosives.

**WAC 296-155-775 Preparatory operations.** (1) Prior to permitting employees to start demolition operations, an engineering survey shall be made, by a competent person, of the structure to determine structural integrity and the possibility of unplanned collapse of any portion of the structure. Any adjacent structure where employees may be exposed shall also be similarly checked. The employer shall have in writing, evidence that such a survey has been performed.

(2) A copy of the survey report and of the plans and/or methods of operations shall be maintained at the job site for the duration of the demolition operation.

(3) Any device or equipment such as scaffolds, ladders, derricks, hoists, etc., used in connection with demolition work shall be constructed, installed, inspected, maintained and operated in accordance with the regulations governing the construction, installation, inspection, maintenance and operation of such device or equipment as specified in other parts of this chapter.

(4) Federal and state codes, safety standards, rules, regulations, and ordinances governing any and all phases of demolition work shall be observed at all times.

(5) Demolition of all buildings and structures shall be conducted under competent supervision, and safe working conditions shall be afforded the employees.

(6) When employees are required to work within a structure to be demolished which has been damaged by fire, flood, explosion, or other cause, the walls or floor shall be shored or braced.

(7) All electric, gas, water, steam, sewer, and other service lines shall be shut off, capped, or otherwise controlled, outside the building line before demolition work is started. In each case, any utility company which is involved shall be notified in advance.

(8) If it is necessary to maintain any power, water or other utilities during demolition, such lines shall be temporarily relocated, as necessary, and protected.

(9) It shall be determined whether asbestos, hazardous materials, hazardous chemicals, gases, explosives, flammable materials, or similarly dangerous substances are present at the work site. When the presence of any such substance is apparent or suspected, testing and removal or purging shall be performed and the hazard eliminated before demolition is started. Removal of such

substances shall be in accordance with the requirements of chapters 296-62 and 296-65 WAC.

(10) Where a hazard exists from fragmentation of glass, such hazards shall be removed.

(11) Where a hazard exists to employees falling through wall openings, the opening shall be protected to a height of between thirty-six and forty-two inches.

(12) When debris is dropped without the use of chutes, the area onto which the material is dropped shall be completely enclosed with barricades not less than forty-two inches high and not less than twenty feet back from the projected edge of the opening above. Signs, warning of the hazard of falling materials, shall be posted at each level. Removal shall not be permitted in this lower area until debris handling ceases above.

(13) All floor openings, not used as material drops, shall be covered over with material substantial enough to support the weight of any load which may be imposed. Such material shall be properly secured to prevent its accidental movement.

(14) Except for the cutting of holes in floors for chutes, holes through which to drop materials, preparation of storage space, and similar necessary preparatory work, the demolition of exterior walls and floor construction shall begin at the top of the structure and proceed downward. Each story of exterior wall and floor construction shall be removed and dropped into the storage space before commencing the removal of exterior walls and floors in the story next below.

(15) Workmen shall not be permitted to carry on a demolition operation which will expose men working on a lower level to danger.

(16) Employee entrances to multistory structures being demolished shall be completely protected by sidewalk sheds or canopies, or both, providing protection from the face of the building for a minimum of eight feet. All such canopies shall be at least two feet wider than the building entrances or openings one foot wider on each side thereof, and shall be capable of sustaining a load of one hundred fifty pounds per square foot.

(17) Protruding nails in boards, planks and timber shall be withdrawn, driven in or bent over as soon as the same is removed from the structure being demolished.

(18) Any material to be removed which will cause dust to be formed, shall be sprinkled with water to lay the dust incidental to its removal.

[Statutory Authority: Chapter 49.17 RCW. 87-24-051 (Order 87-24), § 296-155-775, filed 11/30/87. Statutory Authority: RCW 49.17.050(2) and 49.17.040. 87-10-008 (Order 87-06), § 296-155-775, filed 4/27/87. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-775, filed 1/21/86; Order 74-26, § 296-155-775, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-780 Stairs, passageways, and ladders.** (1) Only those stairways, passageways, and ladders, designated as means of access to the structure of building, shall be used. Other access ways shall be entirely closed off at all times.

(2) All stairs, passageways, ladders and incidental equipment thereto, which are covered by this section, shall be periodically inspected and maintained in a clean safe condition.

(3) All ladders shall be secured in position.

(4) In a multistory building, when a stairwell is being used, it shall be properly illuminated by either natural or artificial means, and completely and substantially covered over at a point not less than two floors below the floor on which work is being performed. Access to the floor where the work is in progress shall be through a properly lighted, protected, and separate passageway.

[Order 74-26, § 296-155-780, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-785 Chutes.** (1) No material shall be dropped to any point lying outside the exterior walls of the structure unless the area is effectively protected.

(2) All materials chutes, or sections thereof, at an angle of more than 45° from the horizontal, shall be entirely enclosed, except for openings equipped with closures at or about floor level for the insertion of materials. The openings shall not exceed 48 inches in height measured along the wall of the chute. At all stories below the top floor, such openings shall be kept closed when not in use.

(3) A substantial gate shall be installed in each chute at or near the discharge end. A competent employee shall be assigned to control the operation of the gate, and the backing and loading of trucks.

(4) When operations are not in progress, the area surrounding the discharge end of a chute shall be securely closed off.

(5) Any chute opening, into which workers dump debris, shall be protected by a substantial guardrail between 36 and 42 inches above the floor or other surface on which the men stand to dump the material. Any space between the chute and the edge of openings in the floors through which it passes shall be solidly covered over.

(6) Where the material is dumped from mechanical equipment or wheelbarrows, a securely attached toe-board or bumper, not less than 4 inches thick and 6 inches high, shall be provided at each chute opening.

(7) Chutes shall be designed and constructed of such strength as to eliminate failure due to impact of materials or debris loaded therein.

[Order 74-26, § 296-155-785, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-790 Removal of materials through floor openings.** Any openings cut in a floor for the disposal of materials shall be no larger in size than 25 percent of the aggregate of the total floor area, unless the lateral supports of the removed flooring remain in place. Floors weakened or otherwise made unsafe by demolition operations shall be shored to carry safely the intended imposed load from demolition operations.

[Order 74-26, § 296-155-790, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-795 Removal of walls, masonry sections, and chimneys.** (1) Masonry walls, or other sections of masonry, shall not be permitted to fall upon the floors of the building in such masses as to exceed the safe carrying capacities of the floors.

(1989 Ed.)

(2) No wall section, which is more than one story in height, shall be permitted to stand alone without lateral bracing, unless such wall was originally designed and constructed to stand without such lateral support, and is in a condition safe enough to be self-supporting. All walls shall be left in a stable condition at the end of each shift.

(3) Employees shall not be permitted to work on the top of a wall when weather conditions constitute a hazard.

(4) Structural or load-supporting members on any floor shall not be cut or removed until all stories above such a floor have been demolished and removed. This provision shall not prohibit the cutting of floor beams for the disposal of materials or for the installation of equipment, provided that the requirements of WAC 296-155-790 and 296-155-800 are met.

(5) Floor openings within 10 feet of any wall being demolished shall be planked solid, except when employees are kept out of the area below.

(6) In buildings of "skeleton-steel" construction, the steel framing may be left in place during the demolition of masonry. Where this is done, all steel beams, girders, and similar structural supports shall be cleared of all loose material as the masonry demolition progresses downward.

(7) Walkways or ladders shall be provided to enable employees to safely reach or leave any scaffold or wall.

(8) Walls, which serve as retaining walls to support earth or adjoining structures, shall not be demolished until such earth has been properly braced or adjoining structures have been properly underpinned.

(9) Walls, which are to serve as retaining walls against which debris will be piled, shall not be so used unless capable of safely supporting the imposed load.

[Order 74-26, § 296-155-795, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-800 Manual removal of floors.** (1) Openings cut in a floor shall extend the full span of the arch between supports.

(2) Before demolishing any floor arch, debris and other material shall be removed from such arch and other adjacent floor area. Planks not less than 2 inches by 10 inches in cross section, full size undressed, shall be provided for, and shall be used by employees to stand on while breaking down floor arches between beams. Such planks shall be so located as to provide a safe support for the workmen should the arch between the beams collapse. The open space between planks shall not exceed 16 inches.

(3) Safe walkways, not less than 18 inches wide, formed of planks not less than 2 inches thick if wood, or of equivalent strength if metal, shall be provided and used by workmen when necessary to enable them to reach any point without walking upon exposed beams.

(4) Stringers of ample strength shall be installed to support the flooring planks, and the ends of such stringers shall be supported by floor beams or girders, and not by floor arches alone.

(5) Planks shall be laid together over solid bearings with the ends overlapping at least 1 foot.

[Title 296 WAC—p 2093]

(6) When floor arches are being removed, employees shall not be allowed in the area directly underneath, and such an area shall be barricaded to prevent access to it.

(7) Demolition of floor arches shall not be started until they, and the surrounding floor area for a distance of 20 feet, have been cleared of debris and any other unnecessary materials.

[Order 74-26, § 296-155-800, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-805 Removal of walls, floors, and material with equipment.** (1) Mechanical equipment shall not be used on floors or working surfaces unless such floors or surfaces are of sufficient strength to support the imposed load.

(2) Floor openings shall have curbs or stop-logs to prevent equipment from running over the edge.

(3) Mechanical equipment used shall meet the requirements specified in parts L and M of this chapter.

[Order 74-26, § 296-155-805, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-810 Catch platforms.** (1) During the demolition of the exterior walls of a structure originally more than seventy feet high, catch platforms shall be erected along the exterior faces of such walls where necessary to prevent injury to persons working below.

(2) Such catch platforms shall be constructed and maintained not more than three stories below the story from which the exterior walls are being removed, until the demolition has progressed to within three stories of the ground level.

(3) Catch platforms shall not be less than five feet in width measured in a horizontal distance from the face of the structure and constructed of outriggers and planks. Planks shall be laid tight together and without openings between the planks and the wall.

Note: Catch platforms may be constructed of other approved materials of equal strength and security against falling material.

(4) Catch platforms shall be capable of sustaining a uniform live load of not less than one hundred and twenty-five pounds per square foot.

[Order 74-26, § 296-155-810, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-815 Storage.** (1) The storage of waste material and debris on any floor shall not exceed the allowable floor loads.

(2) In buildings having wooden floor construction, the flooring boards may be removed from not more than one floor above grade to provide storage space for debris, provided falling material is not permitted to endanger the stability of the structure.

(3) When wood floor beams serve to brace interior walls or free-standing exterior walls, such beams shall be left in place until other equivalent support can be installed to replace them.

(4) Floor arches, to an elevation of not more than 25 feet above grade, may be removed to provide storage area for debris: Provided, That such removal does not endanger the stability of the structure.

[Title 296 WAC—p 2094]

(5) Storage space into which material is dumped shall be blocked off, except for openings necessary for the removal of material. Such openings shall be kept closed at all times when material is not being removed.

[Order 74-26, § 296-155-815, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-820 Removal of steel construction.** (1) When floor arches have been removed, planking in accordance with WAC 296-155-800(2) shall be provided for the workers engaged in razing the steel framing.

(2) Cranes, derricks, and other hoisting equipment used shall meet the requirements specified in part L of this chapter.

(3) Steel construction shall be dismantled column length by column length, and tier by tier (columns may be in two-story lengths).

(4) Any structural member being dismembered shall not be overstressed.

[Order 74-26, § 296-155-820, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-825 Mechanical demolition.** (1) No workers shall be permitted in any area, which can be adversely affected by demolition operations, when balling or clamming is being performed. Only those workers necessary for the performance of the operations shall be permitted in this area at any other time.

(2) The weight of the demolition ball shall not exceed 50 percent of the crane's rated load, based on the length of the boom and the maximum angle of operation at which the demolition ball will be used, or it shall not exceed 25 percent of the nominal breaking strength of the line by which it is suspended, whichever results in a lesser value.

(3) The crane boom and loadline shall be as short as possible.

(4) The ball shall be attached to the loadline with a swivel-type connection to prevent twisting of the loadline, and shall be attached by positive means in such manner that the weight cannot become accidentally disconnected.

(5) When pulling over walls or portions thereof, all steel members affected shall have been previously cut free.

(6) All roof cornices or other such ornamental stonework shall be removed prior to pulling walls over.

(7) During demolition, continuing inspections by a competent person shall be made as the work progresses to detect hazards resulting from weakened or deteriorated floors, or walls, or loosened material. No employee shall be permitted to work where such hazards exist until they are corrected by shoring, bracing, or other effective means.

[Order 74-26, § 296-155-825, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-830 Selective demolition by explosives.** Selective demolition by explosives shall comply with chapter 296-52 WAC.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-830, filed 1/21/86; Order 74-26, § 296-155-830, filed 5/7/74, effective 6/6/74.]

## Part T

## REFER TO CHAPTER 296-52 WAC, SAFETY STANDARDS FOR THE POSSESSION, HANDLING AND USE OF EXPLOSIVES.

## DISPOSITION OF SECTIONS FORMERLY CODIFIED IN THIS SUBCHAPTER

- 296-155-850 Definitions applicable to this part. [Order 74-26, § 296-155-850, filed 5/7/74, effective 6/6/74.] Repealed by 86-03-074 (Order 86-14), filed 1/21/86. Statutory Authority: RCW 49.17.040 and 49.17.050.
- 296-155-855 General provisions. [Order 74-26, § 296-155-855, filed 5/7/74, effective 6/6/74.] Repealed by 86-03-074 (Order 86-14), filed 1/21/86. Statutory Authority: RCW 49.17.040 and 49.17.050.
- 296-155-860 Blaster qualifications. [Order 74-26, § 296-155-860, filed 5/7/74, effective 6/6/74.] Repealed by 86-03-074 (Order 86-14), filed 1/21/86. Statutory Authority: RCW 49.17.040 and 49.17.050.
- 296-155-865 Surface transportation of explosives. [Order 74-26, § 296-155-865, filed 5/7/74, effective 6/6/74.] Repealed by 86-03-074 (Order 86-14), filed 1/21/86. Statutory Authority: RCW 49.17.040 and 49.17.050.
- 296-155-870 Underground transportation of explosives. [Order 74-26, § 296-155-870, filed 5/7/74, effective 6/6/74.] Repealed by 86-03-074 (Order 86-14), filed 1/21/86. Statutory Authority: RCW 49.17.040 and 49.17.050.
- 296-155-875 Storage of explosives and blasting agents. [Order 74-26, § 296-155-875, filed 5/7/74, effective 6/6/74.] Repealed by 86-03-074 (Order 86-14), filed 1/21/86. Statutory Authority: RCW 49.17.040 and 49.17.050.
- 296-155-880 Loading of explosives or blasting agents. [Order 74-26, § 296-155-880, filed 5/7/74, effective 6/6/74.] Repealed by 86-03-074 (Order 86-14), filed 1/21/86. Statutory Authority: RCW 49.17.040 and 49.17.050.
- 296-155-885 Initiation of explosive charges—Electric blasting. [Order 74-26, § 296-155-885, filed 5/7/74, effective 6/6/74.] Repealed by 86-03-074 (Order 86-14), filed 1/21/86. Statutory Authority: RCW 49.17.040 and 49.17.050.
- 296-155-890 Use of safety fuse. [Order 74-26, § 296-155-890, filed 9/30/76; Order 74-26, § 296-155-890, filed 5/7/74, effective 6/6/74.] Repealed by 86-03-074 (Order 86-14), filed 1/21/86. Statutory Authority: RCW 49.17.040 and 49.17.050.
- 296-155-895 Use of detonating cord. [Order 74-26, § 296-155-895, filed 5/7/74, effective 6/6/74.] Repealed by 86-03-074 (Order 86-14), filed 1/21/86. Statutory Authority: RCW 49.17.040 and 49.17.050.
- 296-155-900 Firing the blast. [Order 74-26, § 296-155-900, filed 5/7/74, effective 6/6/74.] Repealed by 86-03-074 (Order 86-14), filed 1/21/86. Statutory Authority: RCW 49.17.040 and 49.17.050.
- 296-155-905 Inspection after blasting. [Order 74-26, § 296-155-905, filed 5/7/74, effective 6/6/74.] Repealed by 86-03-074 (Order 86-14), filed 1/21/86. Statutory Authority: RCW 49.17.040 and 49.17.050.
- 296-155-910 Misfires. [Order 74-26, § 296-155-910, filed 5/7/74, effective 6/6/74.] Repealed by 86-03-074 (Order 86-14), filed 1/21/86. Statutory Authority: RCW 49.17.040 and 49.17.050.
- 296-155-915 Underwater blasting. [Order 74-26, § 296-155-915, filed 5/7/74, effective 6/6/74.] Repealed by 86-03-074 (Order 86-14), filed 1/21/86. Statutory Authority: RCW 49.17.040 and 49.17.050.
- 296-155-920 Blasting in excavation work under compressed air. [Order 74-26, § 296-155-920, filed 5/7/74, effective 6/6/74.] Repealed by 86-03-074 (Order 86-14), filed 1/21/86. Statutory Authority: RCW 49.17.040 and 49.17.050.

(1989 Ed.)

## Part U

## POWER DISTRIBUTION AND TRANSMISSION LINES

(RESERVED)

Refer to chapter 296-44 WAC, "Safety standards for electrical construction work."

## Part V

## ROLLOVER PROTECTIVE STRUCTURES AND OVERHEAD PROTECTION

## WAC

- 296-155-950 Rollover protective structures (ROPS) for material handling equipment.
- 296-155-955 Minimum performance criteria for rollover protective structures for designated scrapers, loaders, dozers, graders, and crawler tractors.
- 296-155-960 Protective frame (ROPS) test procedures and performance requirements for wheel-type agricultural and industrial tractors used in construction.
- 296-155-965 Overhead protection for operators of agricultural and industrial tractors.

**WAC 296-155-950 Rollover protective structures (ROPS) for material handling equipment. (1) Coverage.**

(a) This section applies to the following types of material handling equipment: To all rubber-tired, self-propelled scrapers, rubber-tired front-end loaders, rubber-tired dozers, wheel-type agricultural and industrial tractors, crawler tractors, crawler-type loaders, and motor graders, with or without attachments, that are used in construction work. This requirement does not apply to sideboom pipelaying tractors.

(b) The promulgation of specific standards for rollover protective structures for compactors and rubber-tired skidsteer equipment is reserved pending consideration of standards currently being developed.

(2) Equipment manufactured on or after September 1, 1972, Material handling machinery described in subsection (1) of this section and manufactured on or after September 1, 1972, shall be equipped with rollover protective structures which meet the minimum performance standards prescribed in WAC 296-155-955 and 296-155-960, as applicable.

(3) Equipment manufactured before September 1, 1972.

(a) All material handling equipment described in subsection (1) of this section and manufactured or placed in service (owned or operated by the employer) prior to September 1, 1972, shall be fitted with rollover protective structures.

Machines manufactured before July 1, 1969; Reserved pending further study, development, and review.

(b) Rollover protective structures and supporting attachment shall meet the minimum performance criteria detailed in WAC 296-155-955 and 296-155-960, as applicable or shall be designed, fabricated, and installed in a manner which will support, based on the ultimate strength of the metal, at least two times the weight of the prime mover applied at the point of impact.

[Title 296 WAC—p 2095]



(i) The design objective shall be to minimize the likelihood of a complete overturn and thereby minimize the possibility of the operator being crushed as a result of a rollover or upset.

(ii) The design shall provide a vertical clearance of at least 52 inches from the work deck to the ROPS at the point of ingress or egress.

(4) Remounting. ROPS removed for any reason, shall be remounted with equal quality, or better, bolts or welding as required for the original mounting.

(5) Labeling. Each ROPS shall have the following information permanently affixed to the structure:

(a) Manufacturer or fabricator's name and address;

(b) ROPS model number, if any;

(c) Machine make, model, or series number that the structure is designed to fit.

(6) Machines meeting certain existing governmental requirements. Any machine in use, equipped with rollover protective structures, shall be deemed in compliance with this section if it meets the rollover protective structures requirements of the U.S. Army Corps of Engineers, or the Bureau of Reclamation of the U.S. Department of the Interior in effect on April 5, 1972. The requirements in effect are:

(a) U.S. Army Corps of Engineers: General Safety Requirements, EM-385-1-1 (March 1967).

(b) Bureau of Reclamation, U.S. Department of the Interior: Safety and Health Regulations for Construction, Part II (September 1971).

[Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-950, filed 1/21/86; Order 76-29, § 296-155-950, filed 9/30/76; Order 74-26, § 296-155-950, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-955 Minimum performance criteria for rollover protective structures for designated scrapers, loaders, dozers, graders, and crawler tractors.** (1) Definitions. For purposes of this section, "vehicle weight" means the manufacturer's maximum weight of the prime mover for rubber-tired self-propelled scrapers. For other types of equipment to which this section applies, "vehicle weight" means the manufacturer's maximum recommended weight of the vehicle plus the heaviest attachment.

(2) General.

(a) This section prescribes minimum performance criteria for rollover protective structures (ROPS) for rubber-tired self-propelled scrapers; rubber-tired front-end loaders and rubber-tired dozers; crawler tractors, and crawler-type loaders, and motor graders. The vehicle and ROPS as a system shall have the structural characteristics prescribed in subsection (7) of this section for each type of machine described in this subsection.

(b) Equipment listed in subsection (2)(a) of this section may be exempted from the requirements for fitment of ROPS where it can be shown, to the satisfaction of the department, that the equipment will only be used where no rollover hazard will exist.

(3) The static laboratory test prescribed herein will determine the adequacy of the structures used to protect the operator under the following conditions:

(a) For rubber-tired self-propelled scrapers, rubber-tired front-end loaders, and rubber-tired dozers: Operating between 0 and 10 miles per hour over hard clay where rollover would be limited to a maximum roll angle of 360° down a slope of 30° maximum.

(b) For motor graders: Operating between 0 and 10 miles per hour over hard clay where rollover would be limited to 360° down a slope of 30° maximum.

(c) For crawler tractors and crawler-type loaders: Operating between 0 and 10 miles per hour over hard clay where rollover would be limited to a maximum roll angle of 360° down a slope of 45°.

(4) Facilities and apparatus.

(a) The following material is necessary:

(i) Material, equipment, and tiedown means adequate to ensure that the ROPS and its vehicle frame absorb the applied energy.

(ii) Equipment necessary to measure and apply loads to the ROPS. Adequate means to measure deflection and lengths should also be provided.

(iii) Recommended, but not mandatory, types of test setups are illustrated in Figure V-1 for all types of equipment to which this section applies; and in Figure V-2 for rubber-tired self-propelled scrapers; Figure V-3 for rubber-tired front-end loaders, rubber-tired dozers, and motor graders; and Figure V-4 for crawler tractors and crawler-type loaders.

(b) Table V-1 contains a listing of the required apparatus for all types of equipment described in subsection (2)(a) of this section.

TABLE V-1

Means to measure	Accuracy
Deflection of ROPS, inches	± 5% of deflection measured.
Vehicle weight, pounds	± 5% of the weight measured.
Force applied to frame, pounds	± 5% of force measured.
Dimensions of critical zone, inches.	± 0.5 in.

(5) Vehicle condition. The ROPS to be tested must be attached to the vehicle structure in the same manner as it will be attached during vehicle use. A totally assembled vehicle is not required. However, the vehicle structure and frame which support the ROPS must represent the actual vehicle installation. All normally detachable windows, panels, or nonstructural fittings shall be removed so that they do not contribute to the strength of the ROPS.

(6) Test procedure. The test procedure shall include the following, in the sequence indicated:

(a) Energy absorbing capabilities of ROPS shall be verified when loaded laterally by incrementally applying a distributed load to the longitudinal outside top member of the ROPS, as shown in Figure V-1, V-2 or V-3 as applicable. The distributed load must be applied so as to result in approximately uniform deflection of the



ROPS. The load increments should correspond with approximately 0.5 in. ROPS deflection increment in the direction of the load application, measured at the ROPS top edge. Should the operator's seat be off center, the load shall be applied on the off center side. For each applied load increment, the total load (lb.) versus corresponding deflection (in.) shall be plotted, and the area under the load-deflection curve shall be calculated. This area is equal to the energy (in.-lb.) absorbed by the ROPS. For a typical load-deflection curve and calculation method, see Figure V-5.

Incremental loading shall be continued until the ROPS has absorbed the amount of energy and the minimum applied load specified under subsection (7) of this section has been reached or surpassed.

(b) To cover the possibility of the vehicle coming to rest on its top, the support capability shall be verified by applying a distributed vertical load to the top of the ROPS so as to result in approximately uniform deflection (see Figure V-1). The load magnitude is specified in subsection (6)(b)(iii) of this section.

(c) The low temperature impact strength of the material used in the ROPS shall be verified by suitable material tests or material certification (see subsection (7)(b)(iv) of this section).

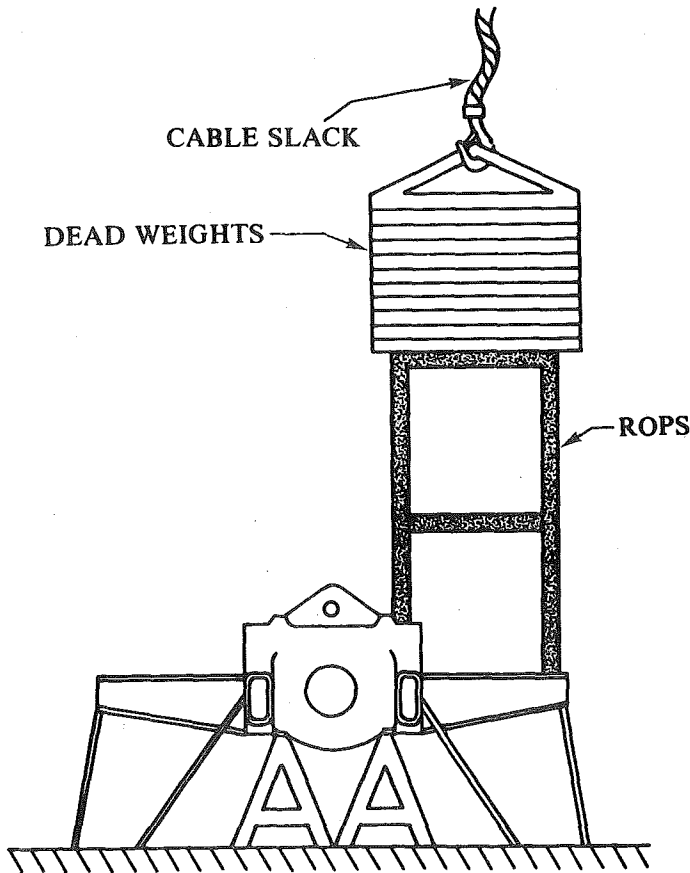


FIGURE V-1

Vertical loading setup for all types of equipment described in WAC 296-155-955(1).

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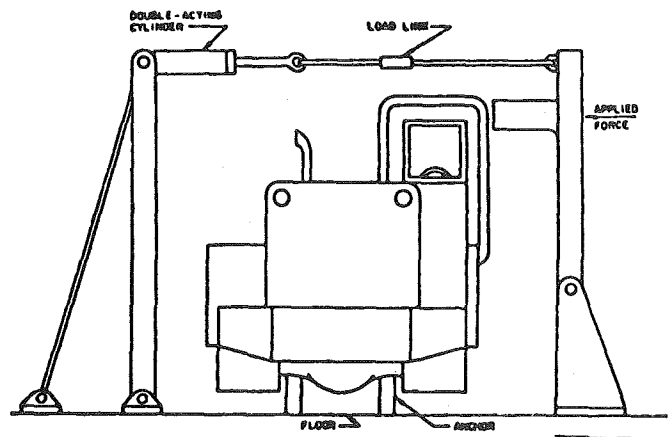


FIGURE V-2

Test setup for rubber-tired self-propelled scrapers.

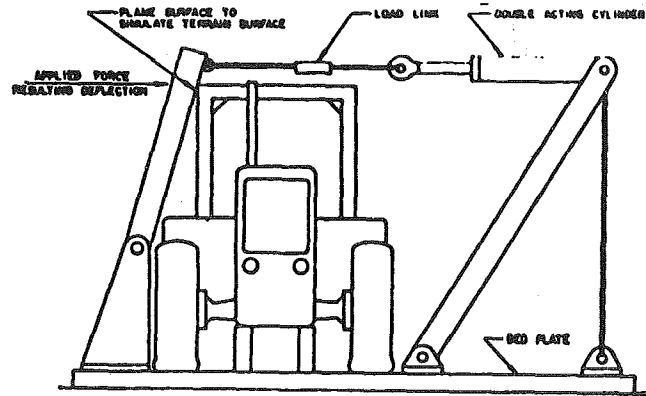


FIGURE V-3

Test setup for rubber-tired front-end loaders, rubber-tired dozers, and motor graders.

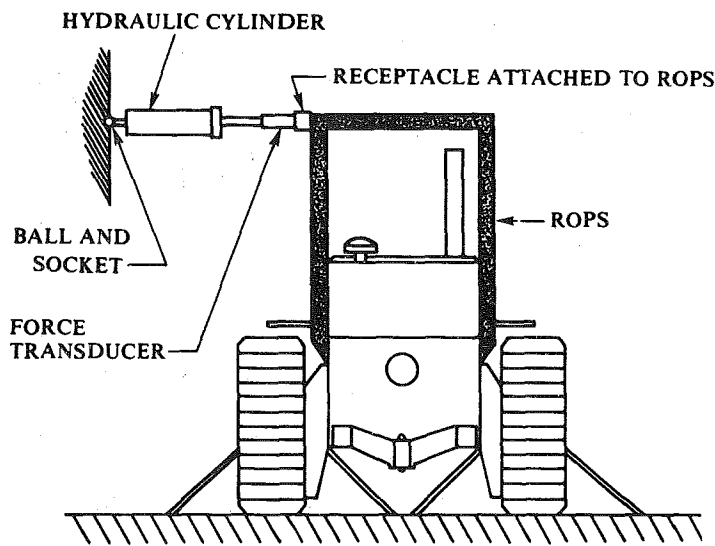


FIGURE V-4

Side-loading setup for crawler tractors and crawler loaders.

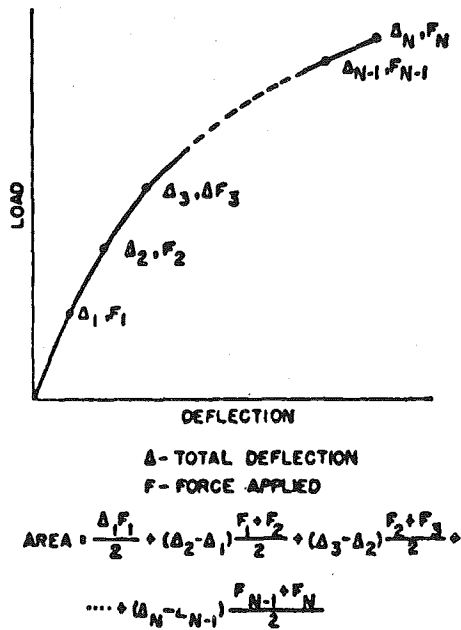


FIGURE V-5

Determination of energy area under force deflection curve for all types of ROPS equipment defined in WAC 296-155-955.

- (7) Performance requirements.
  - (a) General performance requirements.
    - (i) No repairs or straightening of any member shall be carried out between each prescribed test.
    - (ii) During each test, no part of the ROPS shall enter the critical zone as detailed in SAE J397 (1969). Deformation of the ROPS shall not allow the plane of the ground to enter this zone.
  - (b) Specific performance requirements.
    - (i) The energy requirement for purposes of meeting the requirements of subsection (6)(a) of this section is to be determined by referring to the plot of the energy versus weight of vehicle (see Figure V-6 for rubber-tired self-propelled scrapers; Figure V-7 for rubber-tired front-end loaders and rubber-tired dozers; Figure V-8 for crawler tractors and crawler-type loaders; and Figure V-9 for motor graders. For purposes of this section, force and weight are measured as pounds; energy (U) is measured as inch-pounds).

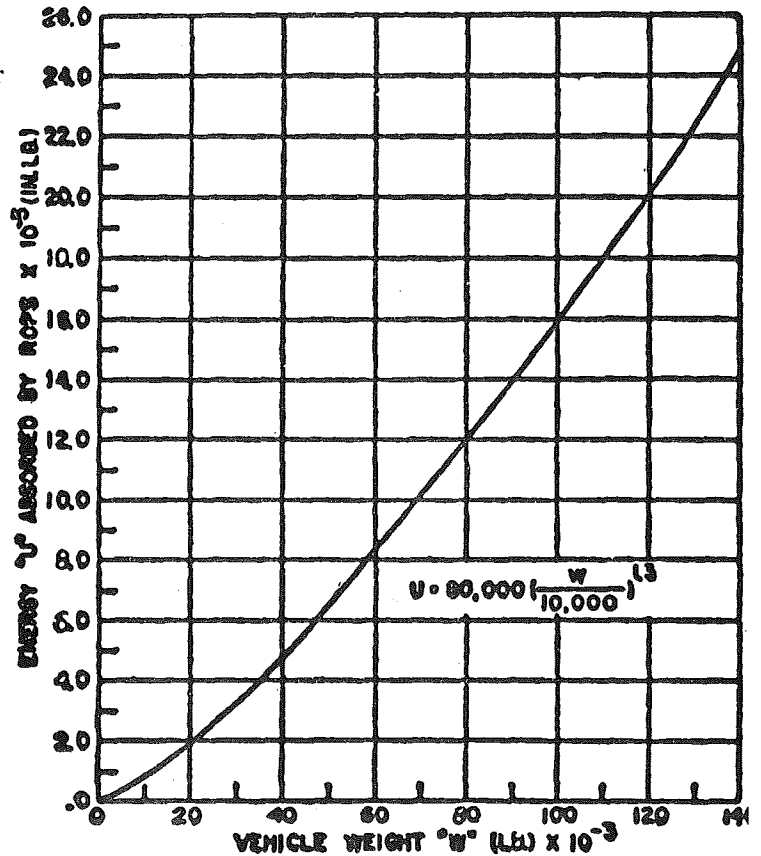


FIGURE V-6

Energy absorbed versus vehicle weight.

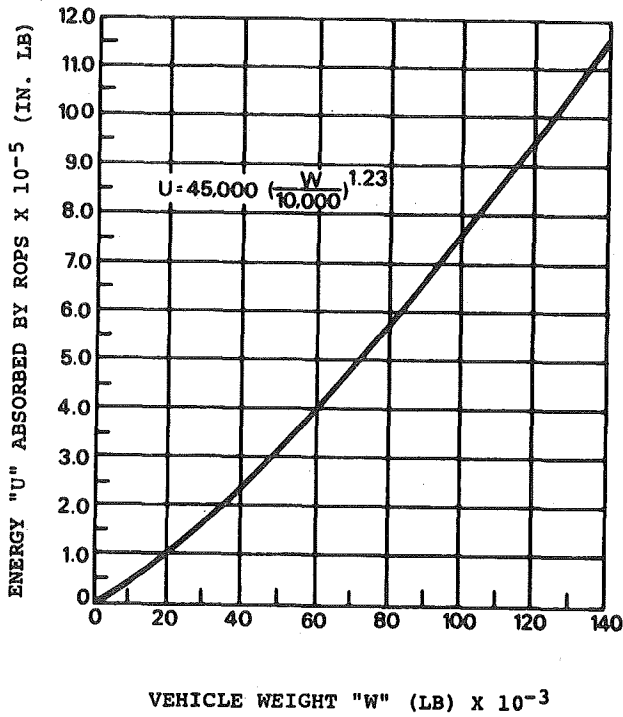


FIGURE V-7

Energy absorbed versus vehicle weight.

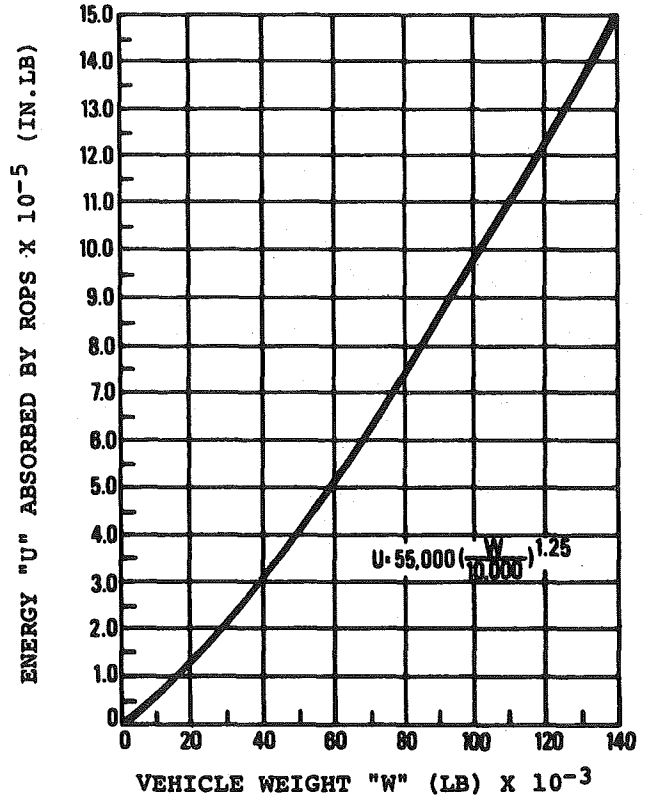


FIGURE V-9

Energy absorbed versus vehicle weight.

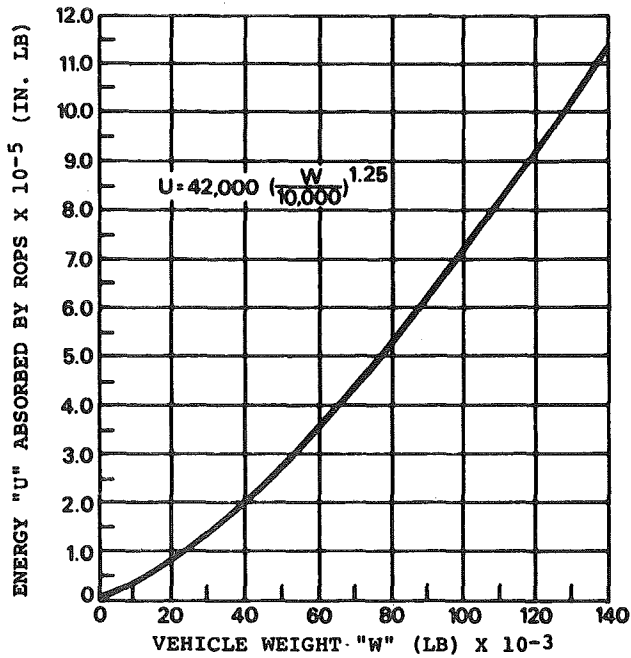


FIGURE V-8

Energy absorbed versus vehicle weight.

ds

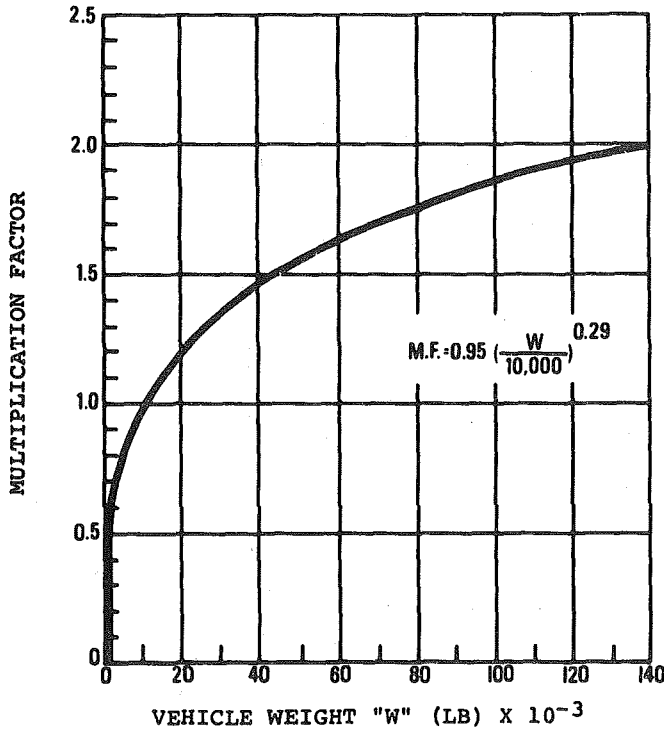


FIGURE V-10

Minimum horizontal load factor for self-propelled scrapers.

(ii) The applied load must attain at least a value which is determined by multiplying the vehicle weight by the corresponding factor shown in Figure V-10 for rubber-tired self-propelled scrapers; in Figure V-11 for rubber-tired front-end loaders and rubber-tired dozers; in Figure V-12 for crawler tractors and crawler-type loaders; and in Figure V-13 for motor graders.

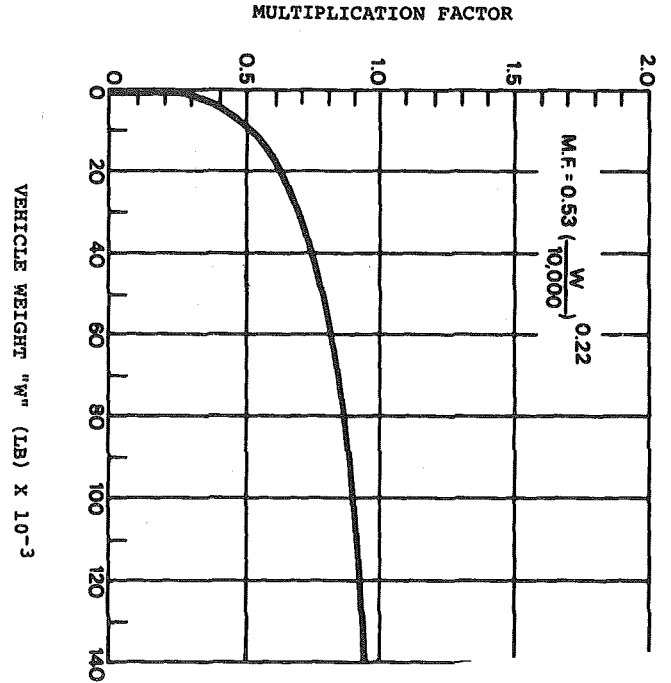


FIGURE V-11

Minimum horizontal load factor for rubber-tired loaders and dozers.

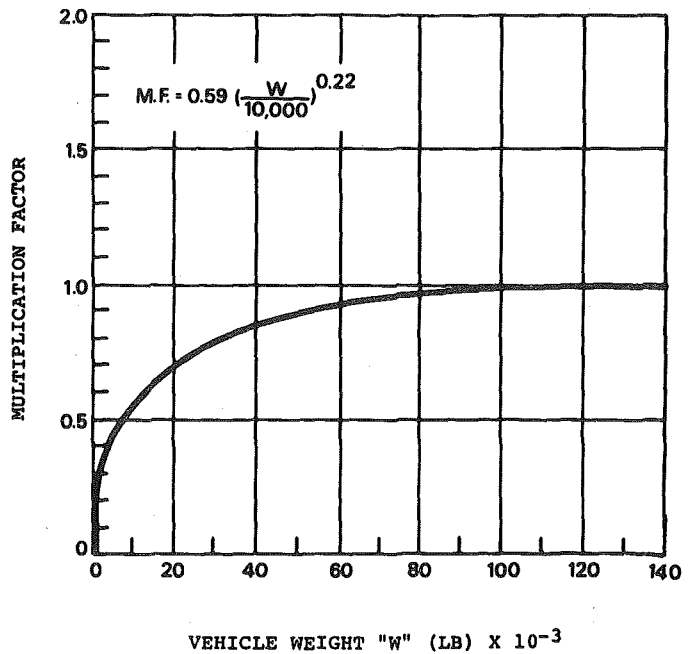


FIGURE V-12

Minimum horizontal load factor for crawler tractors and crawler-type loaders.

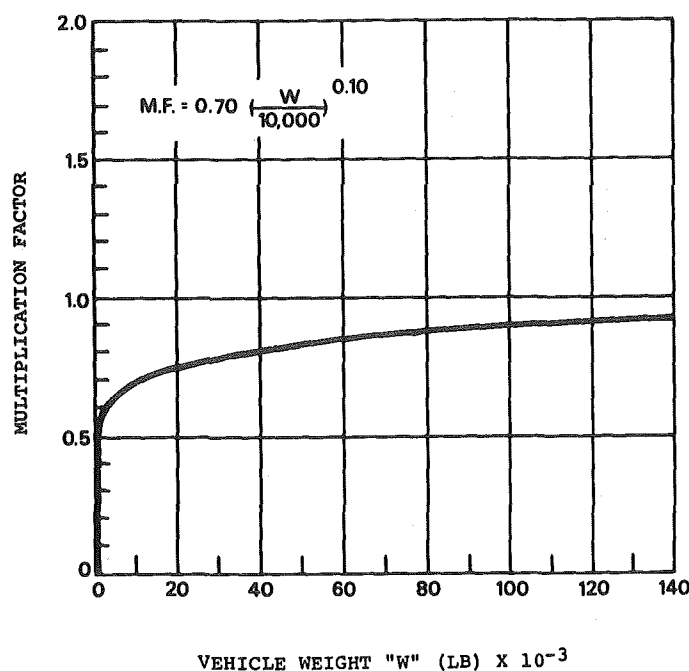


FIGURE V-13

Minimum horizontal load factor for motor graders.

(iii) The load magnitude for purposes of compliance with subsection (6)(b) of this section is equal to the vehicle weight. The test of load magnitude shall only be made after the requirements of subdivision (b)(i) of this subsection are met.

(iv) Material used in the ROPS must have the capability of performing at zero degrees Fahrenheit, or exhibit Charpy V notch impact strength of 8 foot-pounds at minus 20° Fahrenheit. This is a standard Charpy specimen as described in American Society of Testing and Materials A 370, Methods and Definitions for Mechanical Testing of Steel Products. The purpose of this requirement is to reduce the tendency of brittle fracture associated with dynamic loading, low temperature operation, and stress raisers which cannot be entirely avoided on welded structures.

(8) Source of standard. This standard is derived from, and restates, the following Society of Automotive Engineers Recommended Practices: SAE J320a, Minimum Performance Criteria for Roll-Over Protective Structure for Rubber-Tired, Self-Propelled Scrapers; SAE J394, Minimum Performance Criteria for Roll-Over Protective Structure for Rubber-Tired Front-End Loaders and Rubber-Tired Dozers; SAE J395, Minimum Performance Criteria for Roll-Over Protective Structure for Crawler Tractors and Crawler-Type Loaders; and SAE J396, Minimum Performance Criteria for Roll-Over Protective Structure for Motor Graders. These recommended practices shall be resorted to in the event that questions of interpretation arise. The recommended practices appear in the 1971 SAE Handbook, which may be examined in each of the district offices of the division

of industrial safety and health of the department of labor and industries.

[Order 74-26, § 296-155-955, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-960 Protective frame (ROPS) test procedures and performance requirements for wheel-type agricultural and industrial tractors used in construction.**

(1) Definitions applicable to this section.

(a) SAE J333a, Operator Protection for Wheel-Type Agricultural and Industrial Tractors (July 1970) defines "agricultural tractor" as a "wheel-type vehicle of more than 20 engine horsepower designed to furnish the power to pull, carry, propel, or drive implements that are designed for agricultural usage." Since this chapter applies only to construction work, the following definition of "agricultural tractor" is adopted for purposes of this part: "Agricultural tractor" means a wheel-type vehicle of more than 20 engine horsepower, used in construction work, which is designed to furnish the power to pull, propel, or drive implements.

(b) "Industrial tractor" means that class of wheeled type tractor of more than 20 engine horsepower (other than rubber-tired loaders and dozers described in WAC 296-155-955), used in operations such as landscaping, construction services, loading, digging, grounds keeping, and highway maintenance.

(c) The following symbols, terms, and explanations apply to this section:

$E_{is}$  = Energy input to be absorbed during side loading.  $E_{is} = 723 + 0.4 W$  ft.-lb. ( $E'_{is} = 100 + 0.12 W'$ , m. - kg).

$E_{ir}$  = Energy input to be absorbed during rear loading.  $E_{ir} = 0.47 W$  ft. - lb. ( $E'_{ir} = 0.14 W'$ , m. - kg).

$W$  = Tractor weight as prescribed in WAC 296-155-960 (5)(a) and (5)(c) in lb. ( $W'$ , kg).

$L$  = Static load, lb. (kg.).

$D$  = Deflection under  $L$ , in. (mm.).

$L-D$  = Static load-deflection diagram.

$L_m-D_m$  = Modified static load-deflection diagram (Figure V-20). To account for increase in strength due to increase in strain rate, raise  $L$  in plastic range to  $L \times K$ .

$K$  = Increase in yield strength induced by higher rate of loading (1.3 for hot rolled low carbon steel 1010-1030). Low carbon is preferable; however, if higher carbon or other material is used,  $K$  must be determined in the laboratory. Refer to Charles H. Norris, et al., Structural Design for Dynamic Loads (1959), p. 3.

$L_{max}$  = Maximum observed static load.

Load limit = Point on  $L-D$  curve where observed static load is 0.8  $L_{max}$  (refer to Figure V-19).

$E_u$  = Strain energy absorbed by the frame, ft.-lb. (m. - kg) area under  $L_m-D_m$  curve.

FER = Factor of energy ratio,  $FER = E_u/E_{is}$ ; also  $= E_u/E_{ir}$ .

- $P_b$  = Maximum observed force in mounting connection under static load, L, lb. (kg.).
- FSB = Design margin for mounting connection  
 $FSB = (P_u/P_b) - 1$ .
- H = Vertical height of lift of 4,410 lb. (2,000 kg.) weight, in. (H', mm.). The weight shall be pulled back so that the height of its center of gravity above the point of impact is defined as follows:  $H = 4.92 + 0.00190 W$  or ( $H' = 125 + 0.107 W'$ ) (Figure V-14).

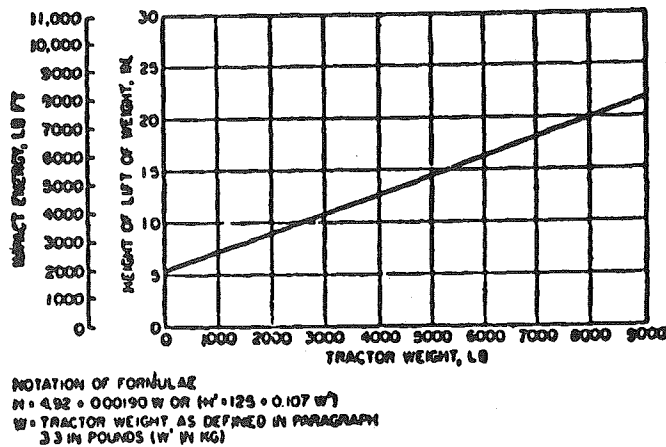


FIGURE V-14

Impact energy and corresponding lift height of 4,410 lb. (2,000 kg.) weight.

(ii) Source of standard. The standard in this section is derived from, and restates, Society of Automotive Engineers Standard J334a (July 1970), Protective Frame Test Procedures and performance requirements. This standard shall be resorted to in the event that questions of interpretation arise. The standard appears in the 1971 SAE Handbook.

(2) General.

(a) The purpose of this section is to set forth requirements for frames for the protection of operators of wheel type agricultural and industrial tractors to minimize the possibility of operator injury resulting from accidental upsets during normal operation. With respect to agricultural and industrial tractors, the provisions of WAC 296-155-955 and 296-155-965 for rubber-tired dozers and rubber-tired loaders may be utilized in lieu of the requirements of this section.

(b) The protective frame which is the subject of this standard is a structure mounted to the tractor that extends above the operator's seat and conforms generally to Figure V-15.

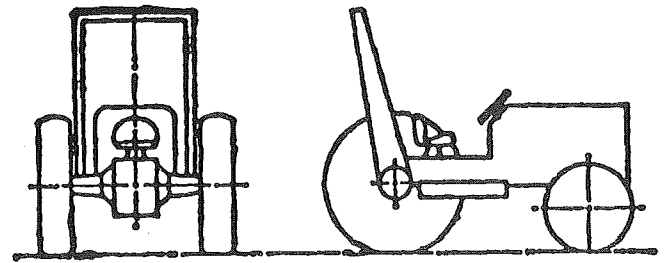


FIGURE V-15

Typical frame configuration.

(c) If an overhead weather shield is attached to the protective frame, it may be in place during tests: *Provided*, That it does not contribute to the strength of the protective frame. If such an overhead weather shield is attached, it must meet the requirements of subsection (10) of this section.

(d) For overhead protection requirements, see WAC 296-155-965.

(e) If protective enclosures are used on wheel-type agricultural and industrial tractors, they shall meet the requirements of Society of Automotive Engineers Standard J168 (July 1970), Protective Enclosures, Test Procedures, and performance requirements.

(3) Applicability. The requirements of this section apply to wheel-type agricultural tractors use in construction work and to wheel-type industrial tractors used in construction work. See subsection (1) of this section for definitions of agricultural tractors and industrial tractors.

(4) Performance requirements.

(a) Either a laboratory test or a field test is required in order to determine the performance requirements set forth in subsection (10) of this section.

(b) A laboratory test may be either static or dynamic. The laboratory test must be under conditions of repeatable and controlled loading in order to permit analysis of the protective frame.

(c) A field upset test, if used, shall be conducted under reasonably controlled conditions, both rearward and sideways, to verify the effectiveness of the protective frame under actual dynamic conditions.

(5) Test procedure—General.

(a) The tractor used shall be the tractor with the greatest weight on which the protective frame is to be used.

(b) A new protective frame and mounting connections of the same design shall be used for each test procedure.

(c) Instantaneous and permanent frame deformation shall be measured and recorded for each segment of the test.

(d) Dimensions relative to the seat shall be determined with the seat unloaded and adjusted to its highest and most rearward latched position provided for a seated operator.

(e) If the seat is offset, the frame loading shall be on the side with the least space between the centerline of the seat and the upright.

(f) The low temperature impact strength of the material used in the protective structure shall be verified by suitable material tests or material certifications in accordance with WAC 296-155-955 (7)(b)(iv).

(6) Test procedure for vehicle overturn.

(a) Vehicle weight. The weight of the tractor, for purposes of this section, includes the protective frame, all fuels, and other components required for normal use of the tractor. Ballast must be added if necessary to achieve a minimum total weight of 130 lb. (59 kg.) per maximum power takeoff horsepower at rated engine speed. The weight of the front end must be at least 33 lb. (15 kg.) per maximum power takeoff horsepower. In case power takeoff horsepower is unavailable, 95 percent of net engine flywheel horsepower shall be used.

(b) Agricultural tractors shall be tested at the weight set forth in subdivision (a) of this subsection.

(c) Industrial tractors shall be tested with items of integral or mounted equipment and ballast that are sold as standard equipment or approved by the vehicle manufacturer for use with the vehicle where the protective frame is expected to provide protection for the operator with such equipment installed. The total vehicle weight and front end weight as tested shall not be less than the weights established in subdivision (a) of this subsection.

(d) The test shall be conducted on a dry, firm soil bank as illustrated in Figure V-16. The soil in the impact area shall have an average cone index in the 0.6 in. (153 mm.) layer not less than 150 according to American Society of Agricultural Engineers Recommendations ASAE R313, Soil Cone Penetrometer. The path of travel of the vehicle shall be  $12^\circ \pm 2^\circ$  to the top edge of the bank.

(e) The upper edge of the bank shall be equipped with an 18 in. (457 mm.) high ramp as described in Figure V-16 to assist in tipping the vehicle.

(f) The front and rear wheel tread settings, where adjustable, shall be at the position nearest to halfway between the minimum and maximum settings obtainable on the vehicle. Where only two settings are obtainable, the minimum setting shall be used.

(g) Vehicle overturn test—Sideways and rearward. (i) The tractor shall be driven under its own power along the specified path of travel at a minimum speed of 10 m.p.h. (16 km./hr.) or maximum vehicle speed if under 10 m.p.h. (16 km./hr.) up the ramp as described in subdivision (e) of this subsection to induce sideways overturn.

(ii) Rear upset shall be induced by engine power with the tractor operating in gear to obtain 3-5 m.p.h. (4.8-8 km./hr.) at maximum governed engine r.p.m. preferably by driving forward directly up a minimum

slope of two vertical to one horizontal. The engine clutch may be used to aid in inducing the upset.

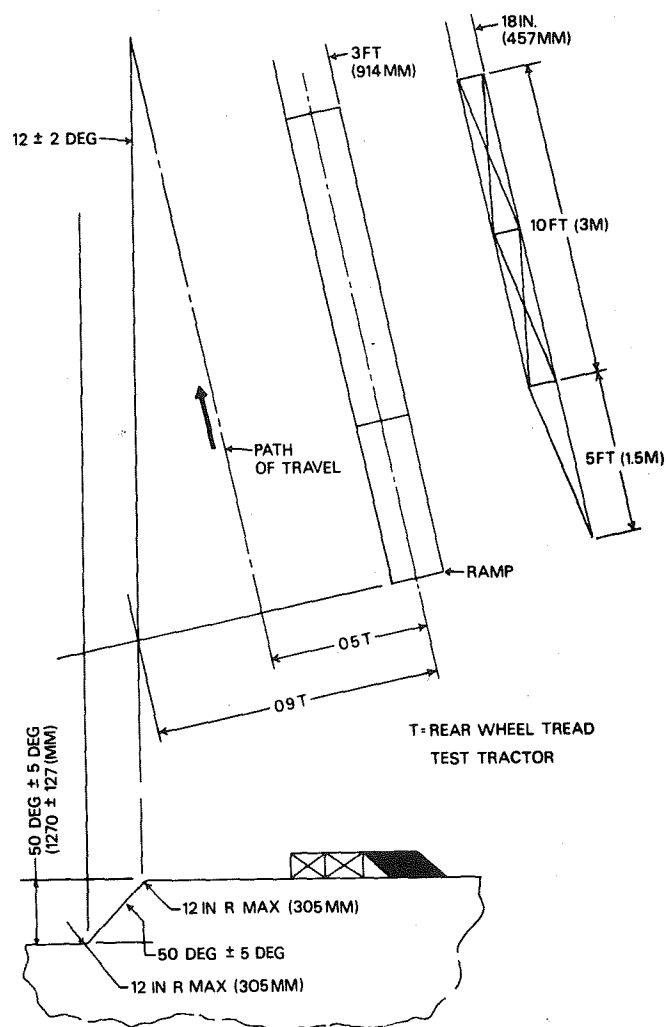


FIGURE V-16

(7) Other test procedures. When the field upset test is not used to determine ROPS performance, either the static test or the dynamic test, contained in subsection (8) or (9) of this section, shall be made.

(8) Static test.

(a) Test conditions.

(i) The laboratory mounting base shall include that part of the tractor chassis to which the protective frame is attached including the mounting parts.

(ii) The protective frame shall be instrumented with the necessary equipment to obtain the required load deflection data at the locations and directions specified in Figures V-17, V-18, and V-19.



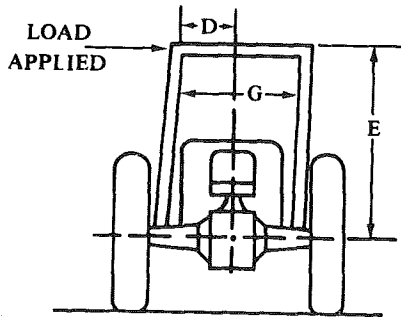


FIGURE V-17  
Side load application

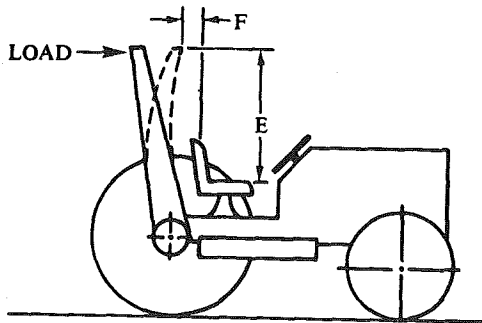
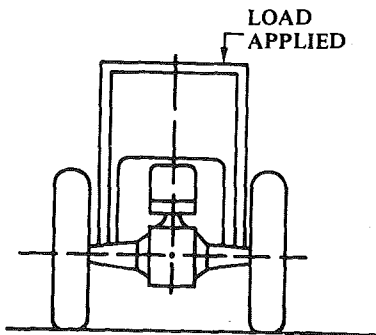


FIGURE V-18  
Rear load application.

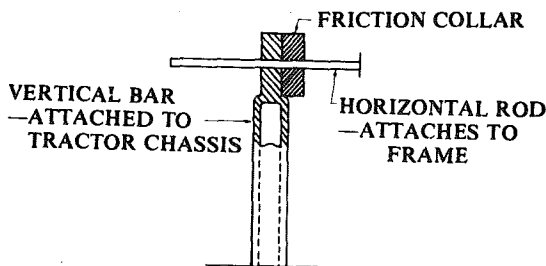


FIGURE V-19  
Method of measuring instantaneous deflection.

(iii) The protective frame and mounting connections shall be instrumented with the necessary recording equipment to obtain the required load-deflection data to be used in calculating FSB (see subsection (1)(c) of this section). The gauges shall be placed on mounting connections before the installation load is applied.

(b) Test procedure.

(i) The side load application shall be at the upper extremity of the frame upright at a 90° angle to the centerline of the vehicle. The side load "L" shall be applied according to Figure V-17. "L" and "D" shall be recorded simultaneously. The test shall be stopped when:

(a) The strain energy absorbed by the frame is equal to the required input energy ( $E_{is}$ ) or

(b) Deflection of the frame exceeds the allowable deflection, or

(c) The frame load limit occurs before the allowable deflection is reached in the side load.

(ii) The L-D diagram, as shown by means of a typical example in Figure V-20, shall be constructed, using the data obtained in accordance with item (i) of this subdivision.

(iii) The modified  $L_m-D_m$  diagram shall be constructed according to item (ii) of this subdivision and according to Figure V-21. The strain energy absorbed by the frame ( $E_{i0}$ ) shall then be determined.

(iv)  $E_{is}$ , FER and FSB shall be calculated.

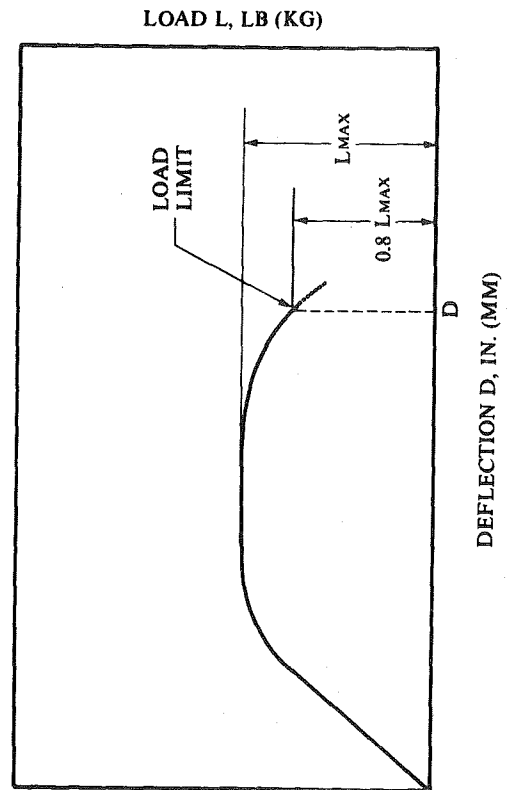


FIGURE V-20  
Typical L-D diagram.

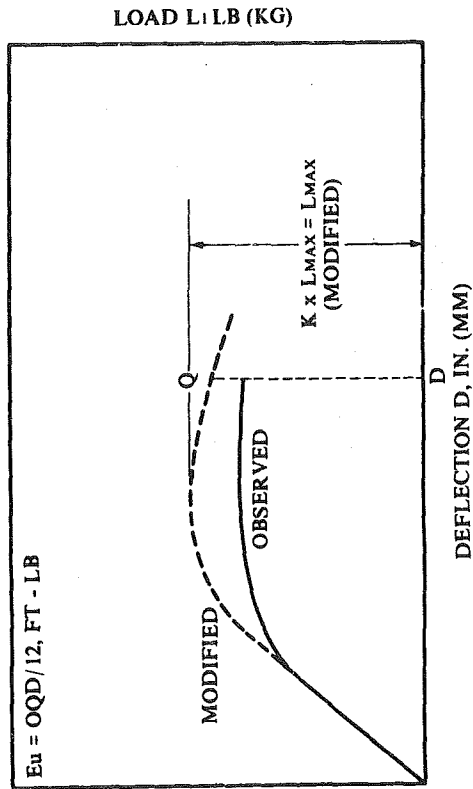


FIGURE V-21

Typical modified  $L_m$ - $D_m$  diagram.

(v) The test procedure shall be repeated on the same frame utilizing L (rear input; see Figure V-19) and  $E_r$ . Rear load application shall be uniformly distributed along a maximum projected dimension of 27 in. (686 mm.) and a maximum area of 160 sq. in. (1,032 sq. cm.) normal to the direction of load application. The load shall be applied to the upper extremity of the frame at the point which is midway between the centerline of the seat and the inside of the frame upright.

(9) Dynamic test.

(a) Test conditions.

(i) The protective frame and tractor shall meet the requirements of subsection (6)(b) or (c) of this section, as appropriate.

(ii) The dynamic loading shall be produced by use of a 4,410 lb. (2,000 kg.) weight acting as a pendulum. The impact face of the weight shall be 27 plus or minus 1 in. by 27 plus or minus 1 in. (686 + or - 25 mm.) and shall be constructed so that its center of gravity is within 1 in. (25.4 mm.) of its geometric center. The weight shall be suspended from a pivot point 18-22 ft. (5.5-6.7 m.) above the point of impact on the frame and shall be conveniently and safely adjustable for height. (See Figure V-22.)

(1989 Ed.)

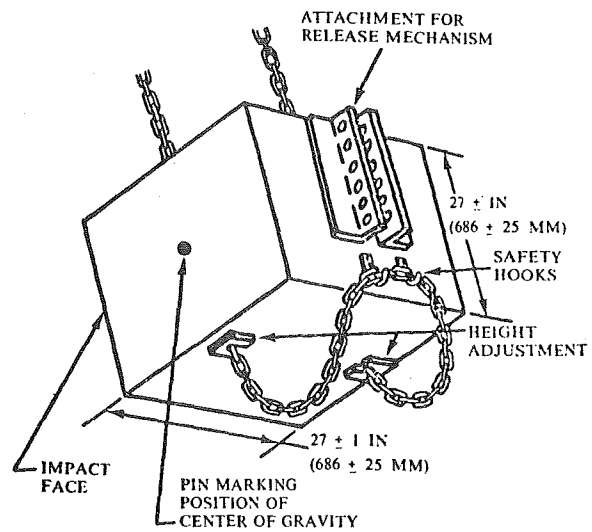


FIGURE V-22

Pendulum.

(iii) For each phase of testing, the tractor shall be restrained from moving when the dynamic load is applied. The restraining members shall be of 0.5-0.63 in. (12.5-16 mm.) steel cable and points of attaching restraining members shall be located an appropriate distance behind the rear axle and in front of the front axle to provide a 15°-30° angle between a restraining cable and the horizontal. The restraining member shall either be in the plane in which the center gravity of the pendulum will swing or more than one restraining cable shall give a resultant force in this plane. (See Figure V-23.)

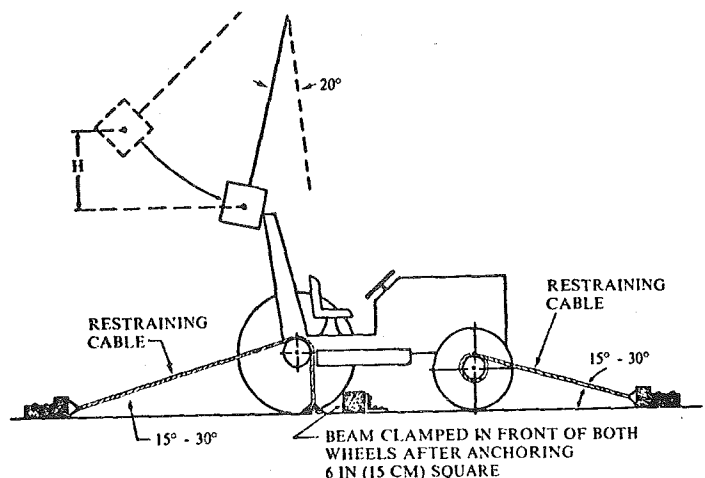


FIGURE V-23

Method of impact from rear.

(iv) The wheel tread setting shall comply with the requirements of subsection (6)(f) of this section. The tires shall have no liquid ballast and shall be inflated to the

maximum operating pressure recommended by the tire manufacturer. With specified tire inflation, the restraining cables shall be tightened to provide tire deflection of 6-8 percent of nominal tire section width. After the vehicle is properly restrained, a wooden beam 6 x 6 in. (15 x 15 cm.) shall be driven tightly against the appropriate wheels and clamped. For the test to the side, an additional wooden beam shall be placed as a prop against the wheel nearest the operator's station and shall be secured to the floor so that it is held tightly against the wheel rim during impact. The length of this beam shall be chosen so that when it is positioned against the wheel rim it is at an angle of 25°-40° to the horizontal. It shall have a length 20-25 times its depth and a width two to three times its depth. (See Figures V-23 and V-24.)

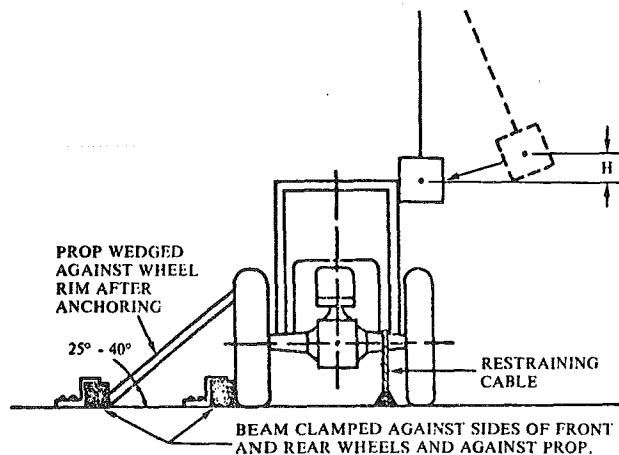


FIGURE V-24

Method of impact from side.

(v) Means shall be provided indicating the maximum instantaneous deflection along the line of impact. A simple friction device is illustrated in Figure V-24.

(vi) No repair or adjustments may be carried out during the test.

(vii) If any cables, props, or blocking shift or break during the test, the test shall be repeated.

(b) Test procedure.

(i) General. The frame shall be evaluated by imposing dynamic loading to rear followed by a load to the side on the same frame. The pendulum dropped from the height (see definition "H" in subsection (1)(c) of this section) imposes the dynamic load. The position of the pendulum shall be so selected that the initial point of impact on the frame shall be in line with the arc of travel of the center of gravity of the pendulum. A quick release mechanism should be used but, if used, shall not influence the attitude of the block.

(ii) Impact at rear. The tractor shall be properly restrained according to subdivisions (a)(iii) and (iv) of this section. The tractor shall be positioned with respect to the pivot point of the pendulum such that the pendulum is 20° from the vertical prior to impact, as shown in

Figure V-23. The impact shall be applied to the upper extremity of the frame at the point which is midway between the centerline of the seat and the inside of the frame upright of a new frame.

(iii) Impact at side. The block and restraining shall conform to subdivisions (a)(iii) and (iv) of this subsection. The point of impact shall be that structural member of the protective frame likely to hit the ground first in a sideways accidental upset. The side impact shall be applied to the side opposite that used for rear impact.

(10) Performance requirements.

(a) General.

(i) The frame, overhead weather shield, fenders, or other parts in the operator area may be deformed but shall not shatter or leave sharp edges exposed to the operator, or violate dimensions as shown in Figures V-17 and V-18 as follows:

D = 2 in. (51 mm.) inside of frame upright to vertical centerline of seat.

E = 30 in. (762 mm.).

F = Not less than 0 in. and not more than 12 in. (305 mm.), measured at centerline front of seat backrest to crossbar along the line of load application as shown in Figure V-17.

G = 24 in. (610 mm.).

(ii) The material and design combination used in the protective structure must be such that the structure can meet all prescribed performance tests at zero degrees Fahrenheit in accordance with WAC 296-155-955 (7)(b)(iv).

(b) Vehicle overturn performance requirements. The requirements of this subsection (10) must be met in both side and rear overturns.

(c) Static test performance requirements. Design factors shall be incorporated in each design to withstand an overturn test as prescribed in this subsection (10). The structural requirements will be generally met if FER is greater than 1 and FSB is greater than K-1 in both side and rear loadings.

(d) Dynamic test performance requirements. Design factors shall be incorporated in each design to withstand the overturn test prescribed in this subsection (10). The structural requirements will be generally met if the dimensions in this subsection (10) are adhered to in both side and rear loads.

[Order 74-26, § 296-155-960, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-965 Overhead protection for operators of agricultural and industrial tractors.** (1) General.

(a) Purpose. When overhead protection is provided on wheel-type agricultural and industrial tractors, the overhead protection shall be designed and installed according to the requirements contained in this section. The provisions of WAC 296-155-955 for rubber-tired dozers and rubber-tired loaders may be used in lieu of the standards contained in this section. The purpose of the standard is to minimize the possibility of operator injury resulting from overhead hazards such as flying and falling objects, and at the same time to minimize

the possibility of operator injury from the cover itself in the event of accidental upset.

(b) Applicability. This section applies to wheel-type agricultural tractors used in construction work and to wheel-type industrial tractors used in construction work. See WAC 296-155-960 (1) and (3). In the case of machines to which WAC 296-155-625 (relating to site clearing) also applies, the overhead protection may be either the type of protection provided in WAC 296-155-625 or the type of protection provided by this section.

(2) Overhead protection. When overhead protection is installed on wheel-type agricultural or industrial tractors used in construction work, it shall meet the requirements of this subsection. The overhead protection may be constructed of a solid material. If grid or mesh is used, the largest permissible opening shall be such that the maximum circle which can be inscribed between the elements of the grid or mesh is 1.5 in. (38 mm.) in diameter. The overhead protection shall not be installed in such a way as to become a hazard in the case of upset.

(3) Test procedures—General.

(a) The requirements of WAC 296-155-960 (5), (6) and (7) shall be met.

(b) Static and dynamic rear load application shall be uniformly distributed along a maximum projected dimension of 27 in. (686 mm.) and a maximum area of 160 in.<sup>2</sup> (1,032 cm.<sup>2</sup>) normal direction of load application. The load shall be applied to the upper extremity of the frame at the point which is midway between the centerline of the seat and the inside of the frame upright.

(c) The static and dynamic side load application shall be uniformly distributed along a maximum projected dimension of 27 in. (686 mm.) and a maximum area of 160 in.<sup>2</sup> (1,032 cm.<sup>2</sup>) normal to the direction of load application. The direction of load application is the same as in WAC 296-155-960 (8) and (9). To simulate the characteristics of the structure during an upset, the center of load application may be located from a point 24 in. (610 mm.) (K) forward to 12 in. (305 mm.) (K) forward to 12 in. (305 mm.) (L) rearward of the front of the seat backrest to best utilize the structural strength. See Figure V-25.

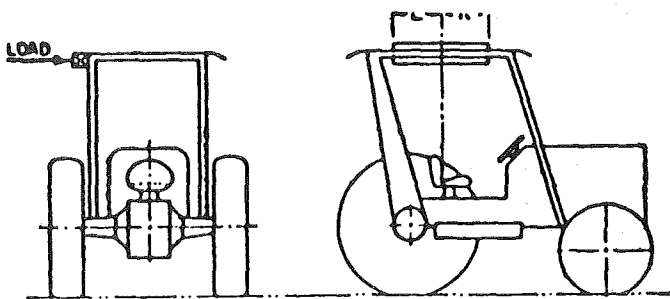


FIGURE V-25

Location for side load.

(4) Drop test procedures.  
(a) The same frame shall be subjected to the drop test following either the static or dynamic test.

(b) A solid steel sphere or material of equivalent spherical dimension weighing 100 lb. (45.4 kg.) shall be dropped once from a height 10 ft. (3,048 mm.) above the overhead cover.

(c) The point of impact shall be on the overhead cover at a point within the zone of protection as shown in Figure V-26, which is furthest removed from major structural members.

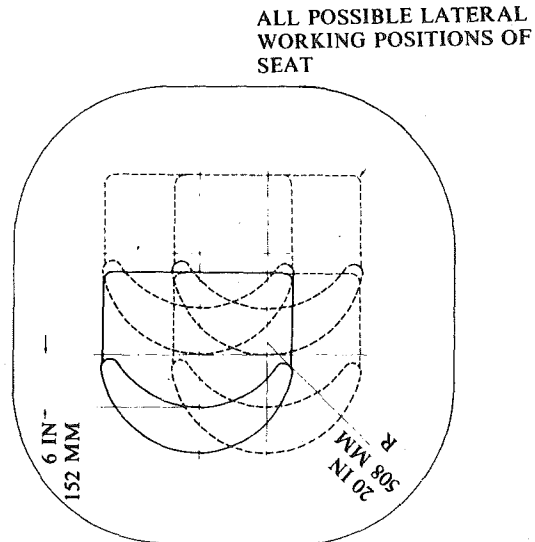


FIGURE V-26

Zone of protection for drop test.

(5) Crush test procedure.

(a) The same frame shall be subjected to the crush test following the drop test and static or dynamic test.

(b) The test load shall be applied as shown in Figure V-27 with the seat positioned as specified in WAC 296-155-960 (5)(d). Loading cylinders shall be pivotally mounted at both ends. Loads applied by each cylinder shall be equal within 2 percent, and the sum of the loads of the two cylinders shall be two times the tractor weight as set forth in WAC 296-155-960 (6)(a). The maximum width of the beam illustrated in Figure V-27 shall be 6 in. (152 mm.).

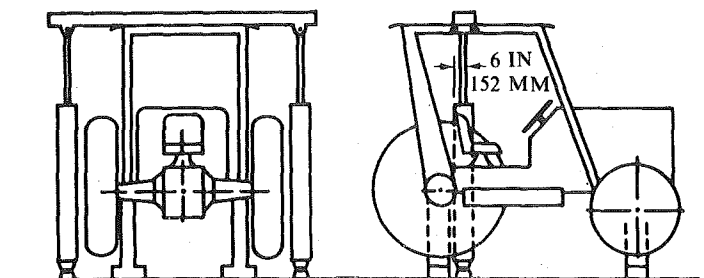


FIGURE V-27

Method of load application for crush test.

## (6) Performance requirements.

(a) General. The performance requirements set forth in WAC 296-155-960 (10)(b), (c) and (d) shall be met.

## (b) Drop test performance requirements.

(i) Instantaneous deformation due to impact of the sphere shall not enter the protected zone as illustrated in Figures V-25, V-26, and V-28.

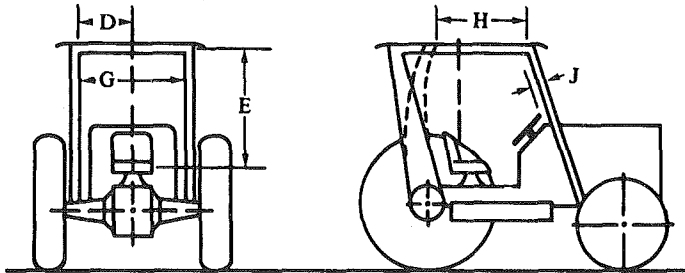


FIGURE V-28

Protected zone during crush and drop tests.

(ii) In addition to the dimensions set forth in WAC 296-155-960(10)(a)(i) the following dimensions apply to Figure V-28:

H = 17.5 in. (444 mm.).

J = 2 in. (50.8 mm.) measured from the outer periphery of the steering wheel.

(c) Crush test performance requirements. The protected zone as described in Figure V-28 must not be violated.

(7) Source of standard. This standard is derived from, and restates, the portions of Society of Automotive Engineers Standard J167 which pertain to overhead protection requirements. The full title of the SAE standard is: Protective Frame with Overhead Protection—Test Procedures and performance requirements. The SAE standard shall be resorted to in the event that questions of interpretation arise. The SAE standard appears in the 1971 SAE Handbook.

[Order 74-26, § 296-155-965, filed 5/7/74, effective 6/6/74.]

## Chapter 296-200 WAC

CONTRACTOR CERTIFICATE OF REGISTRATION  
RENEWALS--SECURITY--INSURANCE

## WAC

296-200-005	Purpose of chapter.
296-200-015	Definitions.
296-200-025	Initial application for registration and renewal of registration.
296-200-035	Length of registration period.
296-200-040	Suspension of contractor's registration.
296-200-050	Change in business structure, name, or address.
296-200-060	Cancelling surety bonds and insurance policies.
296-200-070	Refund of security deposited with the section.
296-200-080	Filing suit against a contractor.
296-200-090	Collection of judgments.
296-200-100	Priority for payment of judgments.
296-200-300	Procedures for issuance of notices of infraction.
296-200-310	Service on employee of a contractor.

[Title 296 WAC—p 2108]

296-200-320	Mailing copy of notice of infraction to contractor.
296-200-330	Issuance of notices of infraction under RCW 18.27-.100 or 18.27.200.
296-200-340	Right to contested hearing—Place to file.
296-200-350	Administrative law judge shall preside in contested hearings.
296-200-360	Representation by counsel.
296-200-370	Contested cases—Notice—Hearing—Summary orders—Informal disposition—Record—Findings of fact.
296-200-380	Contested cases—Evidence.
296-200-390	Administration of appeals.
296-200-400	Fines.
296-200-410	Infraction—Dismissal, when.
296-200-900	Fees.

DISPOSITION OF SECTIONS FORMERLY CODIFIED IN THIS  
CHAPTER

296-200-010	Certificate of registration—Initial application. [Order 74-16, § 296-200-010, filed 5/6/74. Formerly chapter 308-27 WAC.] Repealed by 81-21-001 (Order 81-25), filed 10/8/81. Statutory Authority: RCW 18.27.040.
296-200-020	Reregistration, renewal and reinstatement. [Order 74-16, § 296-200-020, filed 5/6/74. Formerly chapter 308-27 WAC.] Repealed by 81-21-001 (Order 81-25), filed 10/8/81. Statutory Authority: RCW 18.27.040.
296-200-030	Security and insurance requirements. [Order 74-16, § 296-200-030, filed 5/6/74. Formerly chapter 308-27 WAC.] Repealed by 81-21-001 (Order 81-25), filed 10/8/81. Statutory Authority: RCW 18.27.040.

**Reviser's note:** The department of labor and industries repealed department of motor vehicle chapter 308-27 WAC by their Order 74-16, filed in the office of the code reviser on May 6, 1974. The amendment and adoption of the revised rules were subsequently adopted as chapter 296-200 WAC.

**WAC 296-200-005 Purpose of chapter.** The contractor's registration law, chapter 18.27 RCW, is a valuable protection for persons who do business with contractors in Washington. In administering and interpreting the law, however, several problems have arisen. The contractors registration section cannot keep up with the paperwork the law entails. Many people are confused about the provisions in RCW 18.27.040 on suits against contractors and collection of judgments. Also, when a contractor and its bond are sued in several counties at the same time, problems arise over the priority of paying judgments from the bond. The intent of the rules in this chapter is to lessen the paperwork of the section and to clarify the confusing passages of the law. The rules are necessary to ensure that the law is efficiently and properly administered.

[Statutory Authority: RCW 18.27.040. 81-21-001 (Order 81-25), § 296-200-005, filed 10/8/81.]

**WAC 296-200-015 Definitions.** For the purposes of this chapter:

(1) "Bonded contractor" means a contractor who has obtained a surety bond in order to comply with RCW 18.27.040;

(2) "Department" means the department of labor and industries, and the division of building and construction safety inspection services;

(3) "Section" means the contractors registration section of the department;

## (6) Performance requirements.

(a) General. The performance requirements set forth in WAC 296-155-960 (10)(b), (c) and (d) shall be met.

## (b) Drop test performance requirements.

(i) Instantaneous deformation due to impact of the sphere shall not enter the protected zone as illustrated in Figures V-25, V-26, and V-28.

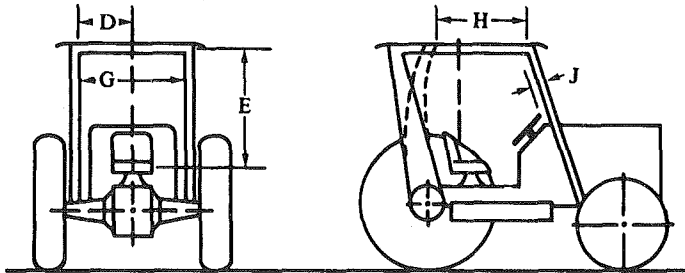


FIGURE V-28

Protected zone during crush and drop tests.

(ii) In addition to the dimensions set forth in WAC 296-155-960(10)(a)(i) the following dimensions apply to Figure V-28:

H = 17.5 in. (444 mm.).

J = 2 in. (50.8 mm.) measured from the outer periphery of the steering wheel.

(c) Crush test performance requirements. The protected zone as described in Figure V-28 must not be violated.

(7) Source of standard. This standard is derived from, and restates, the portions of Society of Automotive Engineers Standard J167 which pertain to overhead protection requirements. The full title of the SAE standard is: Protective Frame with Overhead Protection—Test Procedures and performance requirements. The SAE standard shall be resorted to in the event that questions of interpretation arise. The SAE standard appears in the 1971 SAE Handbook.

[Order 74-26, § 296-155-965, filed 5/7/74, effective 6/6/74.]

## Chapter 296-200 WAC

CONTRACTOR CERTIFICATE OF REGISTRATION  
RENEWALS--SECURITY--INSURANCE

## WAC

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296-200-100	Priority for payment of judgments.
296-200-300	Procedures for issuance of notices of infraction.
296-200-310	Service on employee of a contractor.

[Title 296 WAC—p 2108]

296-200-320	Mailing copy of notice of infraction to contractor.
296-200-330	Issuance of notices of infraction under RCW 18.27-.100 or 18.27.200.
296-200-340	Right to contested hearing—Place to file.
296-200-350	Administrative law judge shall preside in contested hearings.
296-200-360	Representation by counsel.
296-200-370	Contested cases—Notice—Hearing—Summary orders—Informal disposition—Record—Findings of fact.
296-200-380	Contested cases—Evidence.
296-200-390	Administration of appeals.
296-200-400	Fines.
296-200-410	Infraction—Dismissal, when.
296-200-900	Fees.

DISPOSITION OF SECTIONS FORMERLY CODIFIED IN THIS  
CHAPTER

296-200-010	Certificate of registration—Initial application. [Order 74-16, § 296-200-010, filed 5/6/74. Formerly chapter 308-27 WAC.] Repealed by 81-21-001 (Order 81-25), filed 10/8/81. Statutory Authority: RCW 18.27.040.
296-200-020	Reregistration, renewal and reinstatement. [Order 74-16, § 296-200-020, filed 5/6/74. Formerly chapter 308-27 WAC.] Repealed by 81-21-001 (Order 81-25), filed 10/8/81. Statutory Authority: RCW 18.27.040.
296-200-030	Security and insurance requirements. [Order 74-16, § 296-200-030, filed 5/6/74. Formerly chapter 308-27 WAC.] Repealed by 81-21-001 (Order 81-25), filed 10/8/81. Statutory Authority: RCW 18.27.040.

**Reviser's note:** The department of labor and industries repealed department of motor vehicle chapter 308-27 WAC by their Order 74-16, filed in the office of the code reviser on May 6, 1974. The amendment and adoption of the revised rules were subsequently adopted as chapter 296-200 WAC.

**WAC 296-200-005 Purpose of chapter.** The contractor's registration law, chapter 18.27 RCW, is a valuable protection for persons who do business with contractors in Washington. In administering and interpreting the law, however, several problems have arisen. The contractors registration section cannot keep up with the paperwork the law entails. Many people are confused about the provisions in RCW 18.27.040 on suits against contractors and collection of judgments. Also, when a contractor and its bond are sued in several counties at the same time, problems arise over the priority of paying judgments from the bond. The intent of the rules in this chapter is to lessen the paperwork of the section and to clarify the confusing passages of the law. The rules are necessary to ensure that the law is efficiently and properly administered.

[Statutory Authority: RCW 18.27.040. 81-21-001 (Order 81-25), § 296-200-005, filed 10/8/81.]

**WAC 296-200-015 Definitions.** For the purposes of this chapter:

(1) "Bonded contractor" means a contractor who has obtained a surety bond in order to comply with RCW 18.27.040;

(2) "Department" means the department of labor and industries, and the division of building and construction safety inspection services;

(3) "Section" means the contractors registration section of the department;

(4) "Secured contractor" means a contractor who has assigned a savings account to the department or deposited cash or other security with the section in order to comply with RCW 18.27.040; and

(5) "Security" means a savings account assigned to the department or cash or other security deposited with the section;

(6) "Administrative law judge" means any person appointed by the chief administrative law judge, as defined in RCW 34.12.020(2) to preside at contested cases convened under RCW 18.27.100 or 18.27.200;

(7) "Contested case" means any proceeding coming before the department where an administrative law judge is empowered to determine legal rights, duties or privileges of specific parties on behalf of the director;

(8) "Director" means the director of the department of labor and industries or the designee of the director to act in place of the director;

(9) "Infraction" means an alleged violation of RCW 18.27.100 or 18.27.200 as cited by the chief construction compliance inspector, or the department's construction compliance inspectors at the direction of the chief construction compliance inspector;

(10) "Chief construction compliance inspector" means the person designated by the director to administer the activities of all personnel responsible for enforcement and administration of chapter 18.27 RCW.

[Statutory Authority: Chapter 18.27 RCW. 86-19-086 (Order 86-31), § 296-200-015, filed 9/17/86. Statutory Authority: RCW 18.27.040. 81-21-001 (Order 81-25), § 296-200-015, filed 10/8/81.]

**WAC 296-200-025 Initial application for registration and renewal of registration.** (1) A contractor may register if it:

- (a) Completes an application for registration;
- (b) Provides the information required by RCW 18.27.030;
- (c) Obtains a surety bond, assigns a savings account to the department, or deposits cash or other security with the section. If a contractor obtains a bond, it must submit the original bond to the section (see RCW 18.27.040);
- (d) Obtains public liability and property damage insurance, and submits a copy of the insurance certificate to the section (see RCW 18.27.050); and
- (e) Pays a fee of \$40.00.

(2) The section shall send a renewal notice to a contractor's last recorded address at least 45 days before the contractor's registration expires. The contractor may renew its registration if it submits the renewal card and provides the materials required in paragraphs (1)(b), (c), (d), and (e).

(3) The contractor must submit all of the materials to the section in one package. Each of the materials must name the contractor exactly as it is named on the application for registration or the renewal card, as appropriate. If the contractor is renewing its registration, each of the materials must include the contractor's registration number. If any of the materials are missing, do not

properly name the contractor, or do not include the registration number, the section shall refuse to register or renew the registration of the contractor.

(4) The contractor may request, in a letter filed with the application or renewal materials, that the registration period end on a particular day. The resulting registration period may not be longer than one year.

(5) When the section receives the required materials, it shall register or renew the registration of the contractor.

[Statutory Authority: RCW 18.27.020 and 18.27.070. 83-16-059 (Order 83-21), § 296-200-025, filed 8/2/83. Statutory Authority: RCW 18.27.040. 81-21-001 (Order 81-25), § 296-200-025, filed 10/8/81.]

**WAC 296-200-035 Length of registration period.** If a contractor's bond or insurance will expire less than one year after the day the registration begins, the section shall require the contractor to accept a registration period that ends on the day the bond or insurance expires.

If the contractor wants a full one-year registration period, the contractor must obtain a short-term bond or insurance policy that will extend the bond or insurance coverage to the expiration date of the one-year registration period.

[Statutory Authority: RCW 18.27.040. 81-21-001 (Order 81-25), § 296-200-035, filed 10/8/81.]

**WAC 296-200-040 Suspension of contractor's registration.** A contractor can be registered only if it complies with the requirements of WAC 296-200-025. Therefore, if a contractor's surety bond or other security is impaired or cancelled, or if the contractor's insurance policy is cancelled, the section shall suspend the contractor's registration until the contractor obtains a new bond, other security, or insurance policy, or eliminates the impairment to the bond or other security. The contractor may not do business while its registration is suspended.

[Statutory Authority: RCW 18.27.040. 81-21-001 (Order 81-25), § 296-200-040, filed 10/8/81.]

**WAC 296-200-050 Change in business structure, name, or address.** (1) If a contractor changes its business structure (for example, if it changes from a partnership to a corporation, or if the partners in a partnership change), the contractor must apply for a new registration in the manner required by WAC 296-200-025. The new registration must be accompanied by a \$40.00 registration fee. If a contractor does not reregister after a change in its business structure, its registration may be invalid. See RCW 18.27.040.

(2) If a registered contractor changes its name or address it must notify the section of the change. The contractor must include a \$40.00 registration fee with the notification of a change in name.

[Statutory Authority: RCW 18.27.020 and 18.27.070. 83-16-059 (Order 83-21), § 296-200-050, filed 8/2/83. Statutory Authority: RCW 18.27.040, 42.17.290 and 42.17.300. 82-18-026 (Order 82-26), § 296-200-050, filed 8/25/82. Statutory Authority: RCW 18.27.040. 81-21-001 (Order 81-25), § 296-200-050, filed 10/8/81.]



**WAC 296-200-060 Cancellling surety bonds and insurance policies.** (1) A cancellation of a surety bond or insurance policy shall be effective 30 days after the section receives the cancellation notice, if the cancellation notice contains the following information:

- (a) The name of the contractor, exactly as it appears in the contractor's registration file;
- (b) The contractor's registration number;
- (c) The contractor's business address;
- (d) The names of the owners, partners, or officers of the contractor;
- (e) The bond or insurance policy number; and
- (f) The effective date of the bond or insurance policy.

To help the section process cancellations, the information should be given in the order shown.

(2) The insurance and bonding companies should send cancellation notices to the section by certified or registered mail.

[Statutory Authority: RCW 18.27.040. 81-21-001 (Order 81-25), § 296-200-060, filed 10/8/81.]

**WAC 296-200-070 Refund of security deposited with the section.** (1) If a contractor is secured, the section will release its interest in the security one year after the contractor's last registration expired. The section shall not release its interest, however, if an unsatisfied court judgment or claim is outstanding against the contractor.

(2) The section will release its interest in the security before one year has elapsed after the contractor's last registration period expired if the contractor provides a surety bond that covers both the contractor's previous and current registration periods.

[Statutory Authority: RCW 18.27.040. 81-21-001 (Order 81-25), § 296-200-070, filed 10/8/81.]

**WAC 296-200-080 Filing suit against a contractor.** (1) All civil suits against a contractor for claims under chapter 18.27 RCW must be brought in superior court. In particular, if a secured contractor is sued, the section will be unable to pay an unsatisfied final judgment from the securities if the suit is not brought in superior court.

(2) If a claimant sues a contractor, the claimant shall serve the summons and complaint on the contractor and its bonding company by serving three copies of the summons and complaint by registered or certified mail on the section. The section shall not accept personal service of the summons and complaint.

(3) The section may be unable to process a summons and complaint if the summons and complaint do not contain the following information:

- (a) The name of the contractor, exactly as it appears in the contractor's registration file;
- (b) The contractor's business address;
- (c) The names of the owners, partners, or officers of the contractor; and
- (d) The contractor's license number.

If the suit joins a bonding company, the summons and complaint should also include:

- (e) The name of the bonding company that issued the contractor's bond;

(f) The bond number; and

(g) The effective date of the bond.

If the information is insufficient for the section to identify that contractor or bonding company that is being sued, the section will not attempt to serve the summons and complaint and will return them to the claimant.

[Statutory Authority: Chapter 18.27 RCW. 86-19-086 (Order 86-31), § 296-200-080, filed 9/17/86. Statutory Authority: RCW 18.27.040. 81-21-001 (Order 81-25), § 296-200-080, filed 10/8/81.]

**WAC 296-200-090 Collection of judgments.** (1) If a contractor is secured, a claimant who has received a final judgment against the contractor from a superior court may satisfy the judgment out of the security held by the section. The section cannot satisfy a district court judgment.

(2) The section shall satisfy a superior court final judgment if the claimant services on the section, by registered or certified mail, three certified copies of the unsatisfied judgment within one year of the date the judgment was entered. The claimant must include the following information with the copies of the judgment:

- (a) The name of the contractor, exactly as it appears in the contractor's registration file;
- (b) The contractor's business address;
- (c) The names of the owners, partners, or officers of the contractor;
- (d) The contractor's license number; and
- (e) The exact amount of the judgment awarded by the superior court, including attorneys fees and interest.

If the section does not receive sufficient information to enable it to pay the judgment, it shall inform the claimant that more information is needed.

(3) If a contractor is bonded, a claimant who has received a final judgment against the contractor can satisfy the judgment against the contractor or the bonding company only. The section can neither satisfy the judgment nor force the contractor or the bonding company to pay the judgment. The claimant must join the bonding company in the suit if it wants the bonding company to pay the judgment.

[Statutory Authority: RCW 18.27.040. 81-21-001 (Order 81-25), § 296-200-090, filed 10/8/81.]

**WAC 296-200-100 Priority for payment of judgments.** RCW 18.27.040 contains two different provisions for priority in paying judgments from the contractor's bond or security.

(1) If a contractor is secured, the section shall satisfy final judgments against the contractor in the order the section receives the judgments.

(2) If a contractor is bonded, the priority for paying judgments from the bond is not a race priority such as the priority for payment of judgments against a security contractor. Instead, it is similar to the priority in bankruptcies. Claims for labor and employee benefits are satisfied first; claims for breach of contract are satisfied second; material and equipment claims are third; claims for taxes and contributions to the state of Washington

are fourth; and claims for court costs, interest, and attorneys fees are satisfied last. No claim in a lesser category may be satisfied until all claims in the preceding categories are satisfied unless the total amount of all claims in the preceding categories is less than the amount of the bond that remains unimpaired.

[Statutory Authority: RCW 18.27.040, 82-24-057 (Order 82-35), § 296-200-100, filed 12/1/82; 81-21-001 (Order 81-25), § 296-200-100, filed 10/8/81.]

**WAC 296-200-300 Procedures for issuance of notices of infraction.** The department may issue a notice of infraction to a contractor that violates RCW 18.27.100 or 18.27.200. The chief construction compliance inspector shall direct that notices of infraction contain the following when issued:

(1) A statement that the notice represents a determination that the infraction has been committed by the contractor named in the notice and that the determination shall be final unless contested;

(2) A statement that the infraction is a noncriminal offense for which imprisonment shall not be imposed as a sanction;

(3) A statement of the specific violation which necessitated issuance of the infraction;

(4) A statement of the penalty involved if the infraction is established;

(5) A statement informing the contractor of the right to a contested hearing conducted pursuant to chapter 34.04 RCW if requested within twenty days of receipt of the infraction;

(6) A statement that at any hearing to contest the notice of infraction the state has the burden of proving, by a preponderance of the evidence, that the infraction was committed, and that the contractor may subpoena witnesses including the compliance inspector that issued the notice of infraction;

(7) A statement notifying the party issued or served the notice of infraction that he is required to sign the notice of infraction which has the effect of establishing that the contractor promises to respond to the notice of infraction as provided in chapter 18.27 RCW;

(8) A statement notifying the contractor that a refusal to sign the notice of infraction is a misdemeanor and may be punishable by fine or imprisonment in jail, and that failure to respond to a notice of infraction as promised by the contractor may be punished by a fine or imprisonment in jail.

[Statutory Authority: Chapter 18.27 RCW, 86-19-086 (Order 86-31), § 296-200-300, filed 9/17/86. Statutory Authority: RCW 18.27.040, 18.27.200 and 18.106.020, 84-12-018 (Order 84-08), § 296-200-300, filed 5/25/84.]

**WAC 296-200-310 Service on employee of a contractor.** If a contractor is a corporation or a partnership, the department need not serve the contractor personally. In such a case, if no owner, officer, or partner of a violating contractor is on a job site, the department may issue a notice of infraction to any employee on the site. For purposes of serving the notice of infraction, the legislature intended that all employees of a contractor, at whatever level, are authorized to act as, and are, agents

to accept service of the notice of infraction on behalf of the contractor. A promise to appear signed by an employee on behalf of the contractor is binding on the contractor. To lessen possible problems, however, the department shall have the employee complete the promise to appear on the notice of infraction in the following fashion: The employee shall sign the "name of the contractor, by name of the employee." It will appear thus:

Jane Doe Construction Co.  
(by) Richard Roe, Employee.

[Statutory Authority: RCW 18.27.040, 18.27.200 and 18.106.020, 84-12-018 (Order 84-08), § 296-200-310, filed 5/25/84.]

**WAC 296-200-320 Mailing copy of notice of infraction to contractor.** If the department serves a notice of infraction on an employee of a contractor, and not on the owner, officer, or partner of the contractor, the law requires the department to mail by certified mail a copy of the notice of infraction to the contractor if the department can determine the contractor's name and address. If the department cannot determine the contractor's name and address, it need not mail a copy of the notice of infraction; in such a case, the notice of infraction shall remain valid. To ensure further that the contractor receives a copy, the department shall, as well as mail a copy by certified mail, mail a second copy by ordinary mail.

[Statutory Authority: Chapter 18.27 RCW, 86-19-086 (Order 86-31), § 296-200-320, filed 9/17/86. Statutory Authority: RCW 18.27.040, 18.27.200 and 18.106.020, 84-12-018 (Order 84-08), § 296-200-320, filed 5/25/84.]

**WAC 296-200-330 Issuance of notices of infraction under RCW 18.27.100 or 18.27.200.** The department may issue a notice of infraction if the department reasonably believes that the contractor required to be registered has failed to do so.

(1) A notice of infraction issued under this section shall be served personally on the contractor named in the notice by the department's compliance inspectors.

(2) If a notice of infraction is personally served upon an employee of a firm or corporation, the department shall within four days of service send a copy of the notice by certified mail to the contractor if the department is able to obtain the contractor's address.

(3) Constructive service may be made by certified mail directed to the contractor named in the notice of infraction.

[Statutory Authority: Chapter 18.27 RCW, 86-19-086 (Order 86-31), § 296-200-330, filed 9/17/86.]

**WAC 296-200-340 Right to contested hearing-- Place to file.** If a contractor desires to contest the notice of infraction issued, the contractor shall file two copies of a notice of appeal with the department at the office designated on the notice of infraction, within twenty days of issuance of the infraction. The contractor shall also be required to post an appeal bond of two hundred dollars with the notice of appeal payable to the department. The appeal bond shall be applied to the administrative costs of conducting the appeals of notices of

infractions. If the appealing contractor prevails at a contested hearing, then the appeal bond shall be returned to the contractor.

[Statutory Authority: Chapter 18.27 RCW. 87-07-003 (Order 87-08), § 296-200-340, filed 3/5/87; 86-19-086 (Order 86-31), § 296-200-340, filed 9/17/86.]

**WAC 296-200-350 Administrative law judge shall preside in contested hearings.** A notice of infraction when contested, shall be heard before and determined by an administrative law judge from the office of administrative hearings. The administrative law judge shall conduct hearings in these cases at locations in the county where the infraction occurred. The parties shall have the right to apply to the administrative law judge for a change of venue where the interests of justice would be served.

[Statutory Authority: Chapter 18.27 RCW. 87-07-003 (Order 87-08), § 296-200-350, filed 3/5/87; 86-19-086 (Order 86-31), § 296-200-350, filed 9/17/86.]

**WAC 296-200-360 Representation by counsel.** Contractors may appear before the administrative law judge through counsel, or may represent themselves. The department shall be represented by the attorney general.

[Statutory Authority: Chapter 18.27 RCW. 86-19-086 (Order 86-31), § 296-200-360, filed 9/17/86.]

**WAC 296-200-370 Contested cases--Notice--Hearing--Summary orders--Informal disposition--Record--Findings of fact.** The hearings shall be conducted in accordance with chapter 34.04 RCW and chapter 10-08 WAC.

(1) An appeal from the administrative law judges' determination or order shall be to the superior court pursuant to chapter 34.04 RCW.

[Statutory Authority: Chapter 18.27 RCW. 87-07-003 (Order 87-08), § 296-200-370, filed 3/5/87; 86-19-086 (Order 86-31), § 296-200-370, filed 9/17/86.]

**WAC 296-200-380 Contested cases--Evidence.** All relevant evidence shall be admissible in contested hearings convened pursuant to RCW 18.27.100 and 18.27.200. Admission of evidence is further subject to RCW 34.04.100 and 34.04.105 of the Administrative Procedure Act of Washington.

[Statutory Authority: Chapter 18.27 RCW. 86-19-086 (Order 86-31), § 296-200-380, filed 9/17/86.]

**WAC 296-200-390 Administration of appeals.** The department shall record and forward all appeals of notices of infraction received to the office of administrative hearings.

[Statutory Authority: Chapter 18.27 RCW. 86-19-086 (Order 86-31), § 296-200-390, filed 9/17/86.]

**WAC 296-200-400 Fines.** A contractor found to have committed an infraction under RCW 18.27.200 shall be assessed the minimum penalty of a fine of two hundred dollars for the first noncompliance violation. A cited unregistered contractor that continues to do work as a contractor, and is cited for same, shall be subject to

[Title 296 WAC--p 2112]

twice the amount of the last issued infraction, up to the maximum fine of three thousand dollars as provided in chapter 18.27 RCW.

[Statutory Authority: Chapter 18.27 RCW. 86-19-086 (Order 86-31), § 296-200-400, filed 9/17/86.]

**WAC 296-200-410 Infraction--Dismissal, when.** The court shall dismiss the notice of infraction at any time upon written notification from the department that the contractor named in the notice of infraction was registered at the time the notice of infraction was issued.

[Statutory Authority: Chapter 18.27 RCW. 86-19-086 (Order 86-31), § 296-200-410, filed 9/17/86.]

**WAC 296-200-900 Fees.** (1) The department shall charge a \$40.00 fee for each registration and renewal of registration. For purposes of this rule, a contractor renews its registration after its registration expires, or after the registration has been suspended because the contractor's bond or insurance has been cancelled. The department shall charge \$10.00 for providing a duplicate certificate of registration.

(2) The department will charge \$2.00 per copy for documents from a contractor's file. The department shall not charge more than a total of \$24.00 for copies from one contractor's file.

[Statutory Authority: RCW 18.27.020 and 18.27.070. 83-16-059 (Order 83-21), § 296-200-900, filed 8/2/83. Statutory Authority: RCW 18.27.040, 42.17.290 and 42.17.300. 82-18-026 (Order 82-26), § 296-200-900, filed 8/25/82. Statutory Authority: RCW 18.27.040. 81-21-001 (Order 81-25), § 296-200-900, filed 10/8/81.]

## Chapter 296-301 WAC SAFETY STANDARDS FOR THE TEXTILE INDUSTRY

### WAC

296-301-010	Textiles--Application requirements.
296-301-015	Definitions applicable to this chapter.
296-301-020	General safety requirements.
296-301-025	Openers and pickers.
296-301-030	Cotton cards.
296-301-035	Garnett machines.
296-301-040	Spinning mules.
296-301-045	Slashers--Scope and application.
296-301-04501	Cylinder dryers.
296-301-04503	Enclosed hot air dryers.
296-301-050	Warpers.
296-301-055	Drawing frames, slubbers, roving parts, cotton comb-ers, ring spinning frames, twist-ers.
296-301-060	Gill boxes.
296-301-065	Heavy draw boxes, finishers, and speeders used in worsted drawing.
296-301-070	Silver and ribbon lappers (cotton).
296-301-075	Looms.
296-301-080	Shearing machines.
296-301-085	Continuous bleach range (cotton and rayon).
296-301-090	Kiers.
296-301-095	Gray and white bins.
296-301-100	Mercerizing range (piece goods).
296-301-105	Tenter frames.
296-301-110	Dyeing jigs.
296-301-115	Padders--Nip guards.
296-301-120	Drying cans.
296-301-125	Ironer.
296-301-130	Extractors.
296-301-135	Nip guards.

296-301-140	Sanforizing and palmer machine.
296-301-145	Rope washers.
296-301-150	Laundry washer tumbler or shaker.
296-301-155	Printing machine (roller type).
296-301-160	Calenders.
296-301-165	Rotary staple cutters.
296-301-170	Clothing folding machine.
296-301-175	Hand bailing machine.
296-301-180	Roll bench.
296-301-185	Cuttle or swing folder (overhead type).
296-301-190	Color-mixing room.
296-301-195	Open tanks and vats for mixing and storage of hot or corrosive liquids.
296-301-200	Dye kettles and vats.
296-301-205	Acid carboys.
296-301-210	Handling caustic soda and caustic potash.
296-301-215	First aid.
296-301-220	Personal protective equipment.
296-301-225	Workroom ventilation.

**WAC 296-301-010 Textiles--Application requirements.** (1) Application. The requirements of this chapter for textile safety apply to the design, installation, processes, operation, and maintenance of textile machinery, equipment, and other plant facilities in all plants engaged in the manufacture and processing of textiles, except those processes used exclusively in the manufacture of synthetic fibers.

(2) These standards shall be augmented by the Washington state general safety and health standards, and any other regulations of general application which are or will be made applicable to all industries.

(3) The provisions of this chapter shall prevail in the event of conflict with or duplication of, provisions contained in chapter 296-24 WAC, the general safety and health standards and chapter 296-62 WAC, the general occupational health standards.

(4) WAC 296-24-006 through 296-24-012 of the general safety and health standards, shall apply where applicable to this industry.

[Order 74-19, § 296-301-010, filed 5/6/74.]

**WAC 296-301-015 Definitions applicable to this chapter.** (1) "Belt shifter" means a device for mechanically shifting a belt from one pulley to another.

(2) "Belt shifter lock" means a device for positively locking the belt shifter in position while the machine is stopped and the belt is idling on the loose pulleys.

(3) "Calendar" means a machine consisting of a set of heavy rollers mounted on vertical side frames and arranged to pass cloth between them. Calendars may have two to ten rollers, or bowls, some of which can be heated.

(4) "Embossing calender" means a calender with two or more rolls, one of which is engraved for producing figured effects of various kinds on a fabric.

(5) "Cans (drying)" means hollow cylindrical drums mounted in a frame so they can rotate. They are heated with steam and are used to dry fabrics or yarn as it passes around the perimeter of the can.

(6) "Carbonizing" means the removing of vegetable matter such as burns, straws, etc., from wool by treatment with acid, followed by heat. The undesired matter is reduced to a carbon-like form which may be removed by dusting or shaking.

(7) "Card" machine means a machine consisting of cylinders of various sizes—and in certain cases flats—covered with card clothing and set in relation to each other so that fibers in staple form may be separated into individual relationship. The speed of the cylinders and their direction of rotation varies. The finished product is delivered as a sliver. Cards of different types are: The revolving flat card, the roller-and-clearer card, etc.

(8) "Card clothing" means the material with which many of the surfaces of a card are covered; e.g., the cylinder, doffer, etc. It consists of a thick foundation material, usually made of textile fabrics, through which are pressed many fine, closely spaced, specially bent wires.

(9) "Comber" means a machine for combing fibers of cotton, wool, etc. The essential parts are a device for feeding forward a fringe of fibers at regular intervals and an arrangement of combs or pins which, at the right time, pass through the fringe. All tangled fibers, short fibers, and neps are removed and the long fibers are laid parallel.

(10) "Combing machinery" means a general classification, including combers, sliver lap machines, ribbon lap machines, and gill boxes, but excluding cards.

(11) "Cutter (rotary staple)" means a machine consisting of one or more rotary blades used for the purpose of cutting textile fibers into staple lengths.

(12) "Exposed to contact" means that the location of an object, material, nip point, or point of operation is such that a person is liable to come in contact with it in his normal course of employment.

(13) "Garnett machine" means any of a number of types of machines for opening hard twisted waste of wool, cotton, silk, etc. Essentially, such machines consist of a lickerin; one or more cylinders, each having a complement worker and stripper rolls; and a fancy roll and doffer. The action of such machines is somewhat like that of a wool card, but it is much more severe in that the various rolls are covered with garnett wire instead of card clothing.

(14) "Gill box" means a machine used in the worsted system of manufacturing yarns. Its function is to arrange the fibers in parallel order. Essentially, it consists of a pair of feed rolls and a series of followers where the followers move at a faster surface speed and perform a combing action.

(15) "Interlock" means a device that operates to prevent the operation of machine while the cover or door of the machine is open or unlocked, and which will also hold the cover or door closed and locked while the machine is in motion.

(16) "Jig (dye)" means a machine for dyeing piece goods. The cloth, at full width, passes from a roller through the dye liquor in an open vat and is then wound on another roller. The operation is repeated until the desired shade is obtained.

(17) "Kier" means a large metal vat, usually a pressure type, in which fabrics may be boiled out, bleached, etc.

(18) "Lapper (ribbon)" means a machine used to prepare laps for feeding a cotton comb; its purpose is to

provide a uniform lap in which the fibers have been straightened as much as possible.

(19) "Lapper (sliver)" means a machine in which a number of parallel card slivers are drafted slightly, laid side by side in a compact sheet, and wound into a cylindrical package.

(20) "Loom" means a machine for effecting the interlacing of two series of yarns crossing one another at right angles. The warp yarns are wound on a warp beam and pass through heddles and reed. The filling is shot across in a shuttle and settled in place by reed and lay, and the fabric is wound on a cloth beam.

(21) "Starch mangle" means a mangle that is used specifically for starching cotton goods. It commonly consists of two large rolls and a shallow open vat with several immersion rolls. The vat contains the starch solution.

(22) "Water mangle" means a calender having two or more rolls used for squeezing water from fabrics before drying. Water mangles also may be used in other ways during the finishing of various fabrics.

(23) "Mule" means a type of spinning frame having a head stock and a carriage as its two main sections. The head stock is stationary. The carriage is movable and it carries the spindles which draft and spin the roving into the yarn. The carriage extends over the whole width of the machine and moves slowly toward and away from the head stock during the spinning operation.

(24) "Nip" means the point of contact between two in-running rolls.

(25) "Openers and pickers" means a general classification which includes breaker pickers, intermediate pickers, finisher pickers, single process pickers, multiple process pickers, willow machines, card and picker waste cleaners, thread extractors, shredding machines, roving waste openers, shoddy pickers, bale breakers, feeders, vertical openers, lattice cleaners, horizontal cleaners, and any similar machinery equipped with either cylinders, screen section, calender section, rolls, or beaters used for the preparation of stock for further processing.

(26) "Paddler" means equipment consisting of a trough for a solution and two or more squeeze rolls between which cloth passes after being passed through a mordant or dye bath.

(27) "Point of operation" means that part of the machine where the work of cutting, shearing, squeezing, drawing, or manipulating the stock in any other way is done.

(28) "Roller printing machine" means a machine consisting of a large central cylinder, or pressure bowl, around the lower part of the perimeter of which is placed a series of engraved color rollers (each having a color trough), a furnisher roller, doctor blades, etc. The machine is used for printing fabrics.

(29) "Continuous bleaching ranges" means ranges of several types and may be made for cloth in rope or open-width form. The goods, after wetting out, pass through a squeeze roll into a saturator containing a solution of caustic soda and then to an enclosed J-box. A V-shaped arrangement is attached to the front part of

the J-box for uniform and rapid saturation of the cloth with steam before it is packed down in the J-box. The cloth, in a single strand rope form, passes over a guide roll down the first arm of the "V" and up the second. Steam is injected into the "V" at the upper end of the second arm so that the cloth is rapidly saturated with steam at this point. The J-box capacity is such that cloth will remain hot for a sufficient time to complete the scouring action. It then passes a series of washers with a squeeze roll in between. The cloth then passes through a second set of saturator, J-box, and washer, where it is treated with the peroxide solution. By slight modification of the form of the unit, the same process can be applied to open-width cloth.

(30) "Mercerizing range" generally means a 3-bowl mangle, a tenter frame, and a number of boxes for washing and scouring. The whole setup is in a straight line and all parts operate continuously. The combination is used to saturate the cloth with sodium hydroxide, stretch it while saturated, and washing out most of the caustic before releasing tension.

(31) "Sanforizing machine" means a machine consisting of a large steam-heated cylinder, an endless, thick, woolen felt blanket which is in close contact with the cylinder for most of its perimeter, and an electrically heated shoe which presses the cloth against the blanket while the latter is in a stretched condition as it curves around feed-in roll.

(32) "Shearing machine" means a machine used in shearing cloth. Cutting action is provided by a number of steel blades spirally mounted on a roller. The roller rotates in close contact with a fixed ledger blade. There may be from one to six such rollers on a machine.

(33) "Singeing machine" means a machine used particularly with cotton, comprised of a heated roller, plate, or an open gas flame. The material is rapidly passed over the roller or the plate or through the open gas flame to remove fuzz or hairiness on yarn or cloth by burning.

(34) "Slasher" means a machine used for applying a size mixture to warp yarns. Essentially, it consists of a stand for holding section beams, a size box, one or more cylindrical dryers or an enclosed hot air dryer, and a beaming end for finding the yarn on the loom beams.

(35) "Industrial organic solvent" means any organic volatile liquid or compound, or any combination of these substances which are used to dissolve or suspend a non-volatile or slightly volatile substance for industrial utilization. It shall also apply to such substances when used as detergents or cleansing agents. It shall not apply to petroleum products when such products are used as fuel.

(36) "Tenter frame" means a machine for drying cloth under tension. It essentially consists of a pair of endless traveling chains fitted with clips of fine pins and carried on tracks. The cloth is firmly held at the selvages by the two chains which diverge as they move forward so that the cloth is brought to the desired width.

(37) "Warper" means any machine for preparing and arranging the yarns intended for the warp of a fabric, specifically, a beam warper.

[Order 74-19, § 296-301-015, filed 5/6/74.]

**WAC 296-301-020 General safety requirements.** (1) Means of stopping machines. Every textile machine shall be provided with individual mechanical or electrical means for stopping such machines. On machines driven by belts and shafting a locking-type shifter or an equivalent positive device shall be used. On operations where injury to the operator might result if motors were to restart after power failures, provision shall be made to prevent machines from automatically restarting upon restoration of power.

(2) Handles. Stopping and starting handles shall be designed to the proper length to prevent the worker's hand or fingers from striking against any revolving part, gear guard, or any other part of the machine.

(3) Machine guarding. Mechanical power-transmission equipment shall be guarded in conformity with WAC 296-24-205 through 296-24-20531, of the general safety and health standards.

(4) Housekeeping. Aisles and working spaces shall be kept in good order, clean and free of obstructions in accordance with requirements of WAC 296-24-120 through 296-24-12015, of the general safety and health standards.

(5) Inspection and maintenance. All guards and other safety devices, including starting and stopping devices, shall be properly maintained.

(6) Lighting and illumination. Lighting and illumination shall conform to the general occupational health standards, chapter 296-62 WAC.

(7) Identification of piping systems. Identification of piping systems shall conform to American National Standard A13.1-1956.

(8) Identification of physical hazards. Identification of physical hazards shall be in accordance with the requirements of WAC 296-24-135 through 296-24-13503, of the general safety and health standards.

(9) Steam pipes. All pipes carrying steam or hot water for process or servicing machinery, when exposed to contact and located within seven feet of the floor or working platform shall be covered with a heat-insulating material, or guarded with equivalent protection.

[Order 74-19, § 296-301-020, filed 5/6/74.]

**WAC 296-301-025 Openers and pickers.** (1) Beater guards. When any opening or picker machinery is equipped with a beater, such beater shall be provided with metal covers which will prevent contact with the beater. Such covers shall be provided with an interlock which will prevent the cover from being raised while the machine is in motion and prevent the operation of the machine while the cover is open.

(2) Cleanout holes. Cleanout holes within reaching distance of the fan or picker beater shall have their covers securely fastened and they shall not be opened while the machine is in motion.

(3) Feed rolls. The feed rolls on all opening and picking machinery shall be covered with a guard designed to prevent the operator from reaching the nip while the machinery is in operation.

(4) Removal of foreign ferrous material. All textile opener lines shall be equipped with magnetic separators,

tramp iron separators, or other means for the removal of foreign ferrous material.

[Order 74-19, § 296-301-025, filed 5/6/74.]

**WAC 296-301-030 Cotton cards.** (1) Enclosures. Cylinder and lickerins shall be equipped with guards and the doffers should be enclosed.

(2) Enclosure fastenings. The enclosures or covers shall be kept in place while the machine is in operation, except when stripping or grinding.

(3) Stripping rolls. On operations calling for flat strippings which are allowed to fall on the doffer cover, where such strippings are removed by hand, the doffer cover shall be kept closed and securely fastened to prevent the opening of the cover while the machine is in operation. When it becomes necessary to clean the cards while they are in motion, a long-handled brush or dust mop shall be used.

[Order 74-19, § 296-301-030, filed 5/6/74.]

**WAC 296-301-035 Garnett machines.** (1) Lickerin. Garnett lickerins shall be enclosed.

(2) Fancy rolls. Garnett fancy rolls shall be enclosed by covers. These shall be installed in a way that keeps worker rolls reasonably accessible for removal or adjustment.

(3) Underside of machine. The underside of the garnett shall be guarded by a screen mesh or other form of enclosure to prevent access while machine is running.

[Order 74-19, § 296-301-035, filed 5/6/74.]

**WAC 296-301-040 Spinning mules.** A substantial fender of metal or hardwood shall be installed in front of the carriage wheels, the fender to extend to within one-fourth inch of the rail.

[Order 74-19, § 296-301-040, filed 5/6/74.]

**WAC 296-301-045 Slashers--Scope and application.** All sections of this chapter which include WAC 296-301-045 in the section number apply to slashers.

[Order 74-19, § 296-301-045, filed 5/6/74.]

**WAC 296-301-04501 Cylinder dryers.** (1) Reducing valves, safety valves, and pressure gages. Reducing valves, safety valves, and pressure gages shall conform to the ASME Pressure Vessel Code, section VIII, Unfired Pressure Vessels, 1968.

(2) Vacuum relief valves. Vacuum relief valves shall conform to the ASME Code for Pressure Vessels, section VIII, Unfired Pressure Vessels, 1968.

(3) Lever control. When slashers are operated by control levers, these levers shall be connected to a horizontal bar or treadle located not more than 69 inches above the floor to control the operation from any point.

(4) Pushbutton control. Slashers operated by pushbutton control shall have stop and start buttons located at each end of the machine, and additional buttons located on both sides of the machine, at the size box and the delivery end. If calender rolls are used, additional buttons shall be provided at both sides of the machine at



points near the nips, except when slashers are equipped with an enclosed dryer.

(5) Nip guards. All nip guards shall comply with the requirements of WAC 296-301-04503(4).

(6) Cylinder enclosure. When enclosures or hoods are used over cylinder drying rolls, such enclosures or hoods shall be provided with an exhaust system which will effectively prevent wet air and steam from escaping into the workroom.

(7) Expansion chambers. Slasher kettles and cookers shall be provided with expansion chambers in the covers, or drains, to prevent surging over. Steam-control valves shall be so located that they can be operated without exposing the worker to moving parts, hot surfaces, or steam.

[Order 74-19, § 296-301-04501, filed 5/6/74.]

**WAC 296-301-04503 Enclosed hot air dryers.** (1) Lever control. When slashers are operated by control levers, these levers shall be connected to a horizontal bar or treadle located not more than 69 inches above the floor to control the operation from any point.

(2) Push-button control. Slashers operated by push-button control shall have one start button at each end of the machine and stop buttons shall be located on both sides of the machines at intervals spaced not more than 6 feet on centers.

Note: Inching buttons should be installed.

(3) Dryer enclosure. The dryer enclosure shall be provided with an exhaust system which will effectively prevent wet air and steam from escaping into the workroom.

(4) Nip guards. All nip guards shall comply with Table R-1.

**TABLE R-1  
GUARD OPENINGS**

Openings in the guard or between the guard and working surface shall not be greater than the following:

Distance of opening from nip point	Maximum width of opening
0 to 1 1/2	1/4
1 1/2 to 2 1/2	3/8
2 1/2 to 3 1/2	1/2
3 1/2 to 5 1/2	5/8
5 1/2 to 6 1/2	3/4
6 1/2 to 7 1/2	7/8
7 1/2 to 8 1/2	1 1/4

The measurements in Table R-1 are all in inches.

(5) Expansion chambers. Slasher kettles and cookers shall be provided with expansion chambers in the covers, or drains, to prevent surging over. Steam control valves shall be so located that they can be operated without exposing the worker to moving parts, hot surfaces, or steam.

[Order 74-19, § 296-301-04503, filed 5/6/74.]

[Title 296 WAC—p 2116]

**WAC 296-301-050 Warpors.** (1) Swiveled double-bar gates. Swiveled double-bar gates shall be installed on all warpors operating in excess of 450 yards per minute. These gates shall be so interlocked that the machine cannot be operated until the gate is in the "closed position," except for the purpose of inching or jogging.

(2) Closed position. "Closed position" shall mean that the top bar of the gate shall be at least 42 inches from the floor or working platform; and the lower bar shall be at least 21 inches from the floor or working platform; and the gate shall be located 15 inches from the vertical tangent to the beam head.

[Order 74-19, § 296-301-050, filed 5/6/74.]

**WAC 296-301-055 Drawing frames, slubbers, roving parts, cotton combers, ring spinning frames, twistors.** Gear housing covers on all installations of drawing frames, slubbers, roving frames, cotton combers, ring spinning frames, and twistors shall be equipped with interlocks.

[Order 74-19, § 296-301-055, filed 5/6/74.]

**WAC 296-301-060 Gill boxes.** (1) Pin guard. A guard shall be placed ahead of the feed end and shall be so designed that it will prevent the worker's fingers from being caught in the pins of the intersecting fallers.

(2) Nip guards. All nip guards shall comply with the requirements of WAC 296-301-04503(4).

[Order 74-19, § 296-301-060, filed 5/6/74.]

**WAC 296-301-065 Heavy draw boxes, finishers, and speeders used in worsted drawing.** (1) Band pulley covers. Covers for band pulleys shall be closed when the machine is in motion.

(2) Benches or working platforms. Benches or working platforms approximately 10 inches in height and 8 inches in width should be installed along the entire running length of the machine for the worker to stand on while creeling the machine. Such benches or platforms shall be covered with an abrasive or nonslip material.

[Order 74-19, § 296-301-065, filed 5/6/74.]

**WAC 296-301-070 Silver and ribbon lappers (cotton).** Cover guard. An interlocking cover guard shall be installed over the large calender drums and the lap spool, designed to prevent the operator from coming in contact with the nip.

[Order 74-19, § 296-301-070, filed 5/6/74.]

**WAC 296-301-075 Looms.** (1) Shuttle guard. Each loom shall be equipped with a guard designed to minimize the danger of the shuttle flying out of the shed.

(2) Protection for loom fixer. Provisions shall be made so that every loom fixer can prevent the loom from being started while he is at work on the loom. This may be accomplished by means of a lock, the key to which is retained in the possession of the loom fixer, or by some other effective means to prevent starting the loom.

[Order 74-19, § 296-301-075, filed 5/6/74.]



**WAC 296-301-080 Shearing machines.** All revolving blades on shearing machines shall be guarded so that the opening between the cloth surface and the bottom of the guard will not exceed three-eighths inch.

[Order 74-19, § 296-301-080, filed 5/6/74.]

**WAC 296-301-085 Continuous bleach range (cotton and rayon).** (1) J-box protection. Each valve controlling the flow of steam, injurious gases, or liquids into a J-box shall be equipped with a chain, lock, and key, so that any worker who enters the J-box can lock the valve and retain the key in his possession. Any other method which will prevent steam, injurious gases, or liquids from entering the J-box while the worker is in it will comply with this provision.

(2) Open-width bleaching. The nip of all in-running rolls on open-width bleaching machine rolls shall be protected with a guard to prevent the worker from being caught at the nip. The guard shall extend across the entire length of the nip.

[Order 74-19, § 296-301-085, filed 5/6/74.]

**WAC 296-301-090 Kiers.** (1) Reducing valves, safety valves, and pressure gages. Reducing valves, safety valves, and pressure gages shall conform to the ASME Code for Unfired Pressure Vessels, section VIII, Unfired Pressure Vessels, 1968.

(2) Kier valve protection. Each valve controlling the flow of steam, injurious gases, or liquids into a kier shall be equipped with a chain, lock, and key, so that any worker who enters the kier can lock the valve and retains the key. Any other method which will prevent steam, injurious gases, or liquids from entering the kier while the worker is in it will be acceptable.

[Order 74-19, § 296-301-090, filed 5/6/74.]

**WAC 296-301-095 Gray and white bins.** Guard rails conforming to WAC 296-24-750 through 296-24-75011, of the general safety and health standards, shall be provided where workers are required to plait by hand from the top of the bin so as to protect the worker from falling to a lower level.

[Order 74-19, § 296-301-095, filed 5/6/74.]

**WAC 296-301-100 Mercerizing range (piece goods).** (1) Stopping devices. A stopping device shall be provided at each end of the machine.

(2) Frame ends. A guard shall be installed at each end of the frame between the in-running chain and the clip opener, to prevent the worker's fingers from being caught.

(3) Mangle and washers. The nip at the in-running rolls shall conform to WAC 296-301-04503(4).

[Order 74-19, § 296-301-100, filed 5/6/74.]

**WAC 296-301-105 Tenter frames.** (1) Stopping devices. A stopping device shall be provided at each end of the machine.

(1989 Ed.)

(2) Frame ends. A guard shall be installed at each end of the frame at the in-running chain and clip opener.

(3) Oil cups. Oil cups shall be located to permit safe and easy access. They shall be of the extension type to permit oiling while machines are operating.

[Order 74-19, § 296-301-105, filed 5/6/74.]

**WAC 296-301-110 Dyeing jigs.** (1) Stopping devices. Each dye jig shall be equipped with individual mechanical or electrical means for stopping the machine.

(2) Roll arms. Roll arms on jigs shall be built to allow for extra large batches, and to prevent the center bar from being forced off, causing the batch to fall.

[Order 74-19, § 296-301-110, filed 5/6/74.]

**WAC 296-301-115 Padders--Nip guards.** All nip guards shall comply with the requirements of WAC 296-301-04503(4).

[Order 74-19, § 296-301-115, filed 5/6/74.]

**WAC 296-301-120 Drying cans.** (1) Pressure reducing valves and pressure gages. Pressure reducing valves and pressure gages shall conform to the ASME Code for Pressure Vessels, section VIII, 1968, Unfired Pressure Vessels.

(2) Vacuum collapse. If cans are not designed to prevent vacuum collapse, each can shall be equipped with one or more vacuum relief valves with openings of such a size as to prevent the collapse of the can if vacuum occurs.

[Order 74-19, § 296-301-120, filed 5/6/74.]

**WAC 296-301-125 Ironer.** (1) Each flat-work or collar ironer shall be equipped with a safety bar or other guard across the entire front of the feed or first pressure rolls, so arranged that the striking of the bar or guard by the hand of the operator or other person will stop the machine. The pressure rolls shall be covered or guarded so that the operator or other person cannot reach into the rolls without removing the guard. This may be either a vertical guard on all sides or a complete cover. If a vertical guard is used, the distance from the floor or working platform to the top of guard shall be not less than 6 feet.

[Order 74-19, § 296-301-125, filed 5/6/74.]

**WAC 296-301-130 Extractors.** (1) Centrifugal extractor.

(a) Cover. Each extractor shall be equipped with a metal cover.

(b) Interlocking device. Each extractor shall be equipped with an interlocking device that will prevent the cover from being opened while the basket is in motion, and also prevent the power operation of the basket while the cover is open.

(c) Brakes. Each extractor shall be equipped with a mechanically or electrically operated brake to quickly stop the basket when the power driving the basket is shut off.

[Title 296 WAC—p 2117]

(d) Maximum allowable speed. Each centrifugal extractor shall be effectively secured in position on the floor or foundation so as to eliminate unnecessary vibration, and shall not be operated at a speed greater than the manufacturer's rating, which shall be stamped where easily visible in letters not less than one-quarter inch in height. The maximum allowable speed shall be given in revolutions per minute (rpm).

(2) Engine drum extractor—Over-speed governor. Each engine individually driving an extractor shall be provided with an engine stop approved as specified in WAC 296-24-006, of the general safety and health standards, and a speed limit governor.

(3) Squeezer or wringer extractor—Nip guards. All nip guards shall comply with the requirements of WAC 296-301-04503(4).

[Order 74-19, § 296-301-130, filed 5/6/74.]

**WAC 296-301-135 Nip guards.** All nip guards for water mangle, starch mangle, backwasher (worsted yarn) crabbing machines, decating machines, shall comply with the requirements of WAC 296-301-04503(4).

[Order 74-19, § 296-301-135, filed 5/6/74.]

**WAC 296-301-140 Sanforizing and palmer machine.** A safety trip rod, cable, or wire center cord shall be provided across the front and back of all palmer cylinders extending the length of the face of the cylinder. It shall operate readily whether pushed or pulled. This safety trip shall be not more than 72 inches above the level on which the operator stands and shall be readily accessible.

[Order 74-19, § 296-301-140, filed 5/6/74.]

**WAC 296-301-145 Rope washers.** (1) Splash guard. Splash guards shall be installed on all rope washers unless the machine is so designed as to prevent the water or liquid from splashing the operator, the floor, or working surface.

(2) Safety stop bar. A safety trip rod, cable or wire center cord shall be provided across the front and back of all rope washers extending the length of the face of the washer. It shall operate readily whether pushed or pulled. This safety trip shall be not more than 72 inches above the level on which the operator stands and shall be readily accessible.

[Order 74-19, § 296-301-145, filed 5/6/74.]

**WAC 296-301-150 Laundry washer tumbler or shaker.** (1) Interlocking device. Each drying tumbler, each double cylinder shaker or clothes tumbler, and each washing machine shall be equipped with an interlock device which will prevent the power operation of the inside cylinder when the outer door on the case or shell is open, and which will also prevent the outer door on the case or shell from being opened without shutting off the power. This should not prevent the movement of the inner cylinder by means of a hand operated mechanism or an "inching device."

[Title 296 WAC—p 2118]

(2) Means of holding covers or doors in open position. Each enclosed barrel shall also be equipped with adequate means for holding open the doors or covers of the inner and outer cylinders or shells while it is being loaded or unloaded.

[Order 74-19, § 296-301-150, filed 5/6/74.]

**WAC 296-301-155 Printing machine (roller type).** (1) Nip guards. All nip guards shall comply with the requirements of WAC 296-301-04503(4).

(2) Crown wheel and roller gear nip protection. The engraved roller gears and the large crown wheel shall be provided with a protective disc which will enclose the nips of the in-running gears. Individual discs for each nip will be deemed to be in compliance with the provisions of WAC 296-301-04503(4).

[Order 74-19, § 296-301-155, filed 5/6/74.]

**WAC 296-301-160 Calenders.** The nip at the in-running side of the rolls shall be provided with a guard extending across the entire length of the nip and arranged to prevent the fingers of the workers from being pulled in between the rolls or between the guard and the rolls, and constructed so that the cloth can be fed into the rolls safely.

[Order 74-19, § 296-301-160, filed 5/6/74.]

**WAC 296-301-165 Rotary staple cutters.** A guard shall be installed completely enclosing the cutters to prevent the hands of the operator from reaching the cutting zone.

[Order 74-19, § 296-301-165, filed 5/6/74.]

**WAC 296-301-170 Clothing folding machine.** The crank arm and blade guide rods on both sides of the cloth-folding machines shall be protected from contact by barrier guards constructed to conform to the requirements of WAC 296-24-195 through 296-24-19513, of the general safety and health standards.

[Order 74-19, § 296-301-170, filed 5/6/74.]

**WAC 296-301-175 Hand bailing machine.** An angle-iron-handle stop guard shall be installed at the right angle to the frame of the machine. The stop guard shall be so designed and so located that it will prevent the handle from traveling beyond the vertical position should the handle slip from the operator's hand when the pawl has been released from the teeth of the takeup gear.

[Order 74-19, § 296-301-175, filed 5/6/74.]

**WAC 296-301-180 Roll bench.** Cleats shall be installed on the ends of roll benches.

[Order 74-19, § 296-301-180, filed 5/6/74.]

**WAC 296-301-185 Cuttle or swing folder (overhead type).** The bottom of the overhead folders shall be located not less than 7 feet from the floor or working surface.

[Order 74-19, § 296-301-185, filed 5/6/74.]

**WAC 296-301-190 Color-mixing room.** Floors in color-mixing rooms shall be constructed to drain easily.

[Order 74-19, § 296-301-190, filed 5/6/74.]

**WAC 296-301-195 Open tanks and vats for mixing and storage of hot or corrosive liquids.** (1) Protection against falls. Open tanks and vats containing hot or corrosive liquids shall be provided with guardrails to conform to the requirements of WAC 296-24-750 through 296-24-75011, of the general safety and health standards.

(2) Shutoff valves. Boiling tanks, caustic tanks, and hot liquid containers, so located that the operator cannot see the contents from the floor or working area, shall have emergency shutoff valves controlled from a point not subject to danger of splash. Valves shall conform to the ASME Pressure Vessel Code, section VIII, Unfired Pressure Vessels, 1968.

[Order 74-19, § 296-301-195, filed 5/6/74.]

**WAC 296-301-200 Dye kettles and vats.** Pipes or drains of sufficient capacity to carry the contents safely away from the working area shall be installed where there are dye kettles and vats which may at any time contain hot or corrosive liquids. These shall not empty directly onto the floor.

[Order 74-19, § 296-301-200, filed 5/6/74.]

**WAC 296-301-205 Acid carboys.** Carboys shall be provided with inclinators, or the acid shall be withdrawn from the carboys by means of pumping without pressure in the carboy, or by means of hand operated siphons.

[Order 74-19, § 296-301-205, filed 5/6/74.]

**WAC 296-301-210 Handling caustic soda and caustic potash.** Means shall be provided for handling and emptying caustic soda and caustic potash containers to prevent workers from coming in contact with the caustic (see WAC 296-301-220).

[Order 74-19, § 296-301-210, filed 5/6/74.]

**WAC 296-301-215 First aid.** The provisions of WAC 296-24-015 through 296-24-070, of the general safety and health standards, shall apply to the textile industry.

[Order 74-19, § 296-301-215, filed 5/6/74.]

**WAC 296-301-220 Personal protective equipment.** (1) Personal protective equipment. Workers engaged in handling acids or caustics in bulk, repairing pipe lines containing acids or caustics, etc., shall be provided with protective occupational (safety) equipment to conform to the requirements of WAC 296-24-07501, 296-24-07801, and 296-24-081 through 296-24-08113, of the general safety and health standards.

(2) Respirators, gas masks, and such appliances, for emergency use only, shall be of a type required by WAC 296-24-081 through 296-24-08113, of the general safety and health standards.

[Order 74-19, § 296-301-220, filed 5/6/74.]

**WAC 296-301-225 Workroom ventilation.** In all workrooms in which potentially toxic substances are used, the maximum allowable concentrations listed in WAC 296-62-075 through 296-62-07515, of the general occupational health standards, shall be maintained. Open surface tanks shall conform to the requirements of WAC 296-62-11021.

[Order 74-19, § 296-301-225, filed 5/6/74.]

## Chapter 296-302 WAC

### SAFETY STANDARDS FOR BAKERY EQUIPMENT

#### WAC

296-302-010	Bakery equipment—General requirements.
296-302-015	Definitions.
296-302-020	General machine guarding.
296-302-025	Flour-handling equipment—Scope and application.
296-302-02501	General requirements for flour-handling.
296-302-02503	Bag chutes and bag lifts (bag-arm elevators).
296-302-02505	Dumpbin and blender.
296-302-02507	Flour elevators.
296-302-02509	Bolting reels.
296-302-02511	Storage bins.
296-302-02513	Screw conveyors.
296-302-02515	Sifters.
296-302-02517	Flour scales.
296-302-02519	Automatic flour gates.
296-302-03001	Horizontal dough mixers.
296-302-03003	Vertical mixers.
296-302-035	Dividers.
296-302-040	Moulders.
296-302-045	Manually fed dough brakes.
296-302-050	Miscellaneous equipment.
296-302-05501	Slicers.
296-302-05503	Wrappers.
296-302-060	Biscuit and cracker equipment.
296-302-065	Ovens—Scope and application.
296-302-06501	General location.
296-302-06503	General requirements.
296-302-06505	Construction.
296-302-06507	Safeguards of mechanical parts.
296-302-06509	Gas-burning systems.
296-302-06511	Gas mixing machines.
296-302-06513	Oil-burning equipment.
296-302-06515	Solid-fuel firing equipment.
296-302-06517	Electrical heating equipment.
296-302-06519	Direct-fired ovens.
296-302-06521	Direct recirculating ovens.
296-302-06523	Flue-type ovens.
296-302-06525	Indirect-fired multiple burner ovens.
296-302-06527	Steam-tube ovens.
296-302-06529	Indirect recirculating ovens.
296-302-06531	Electric ovens.

**WAC 296-302-010 Bakery equipment—General requirements.** (1) Application. The requirements of this chapter shall apply to the design, installation, operation and maintenance of machinery and equipment used within a bakery.

(2) These standards shall be augmented by the Washington state general safety and health standards, and any other regulations of general application which are or will be made applicable to all industries.

(3) The provisions of this chapter shall prevail in the event of a conflict with, or duplication of, provisions contained in chapter 296-24 and 296-62 WAC.

(4) WAC 296-24-006 through 296-24-012 of the general safety and health standards, chapter 296-24 WAC, shall apply where applicable to this industry.

[Order 74-17, § 296-302-010, filed 5/6/74.]

**WAC 296-302-015 Definitions.** (1) "Dumpbin and blender" applies to those elements of a flour handling system in which flour in bags is first emptied for distribution.

(2) "Flour elevator" means the conveyor which is used to convey flour in a vertical direction and it includes bucket, spiral screw, or bulkflow conveyors.

(3) "Screw conveyor" means the conveyor which is used to convey flour in a horizontal or inclined plane by means of a continuous spiral screw enclosed in a suitable casing which follows the same general contour of the perimeter of the screw.

(4) "Bolting reel" means a device in which the flour is screened through a rotating drum.

(5) "Sifter" means a device in which flour is sifted. It may be of the brush, oscillating, or vibrating type.

(6) "Flour scale" means a scale for weighing flour.

(7) "Flour gate" means the device or devices used to control the delivery of flour.

(8) "Direct fired ovens" are ovens which burn fuel directly inside the baking chamber.

(9) "Direct recirculating ovens" are ovens which have heating systems consisting of one or more heaters (located inside or outside the baking chamber), each heater being equipped with a burner, the products of combustion of which are mixed with spent gases returned from the oven. Combustion gases are circulated through the heater and oven chamber by a fan. An overflow or vent removes part of the spent combustion gases to compensate for fresh combustion gases added by the burner.

(10) "Flue-type ovens" are ovens which burn fuel in a furnace which is connected through flues which carry the combustion gases to stack.

(11) "Indirect multiple-burner ovens" are ovens which are heated by burners (usually gas) which are totally enclosed in such a way that unburned gases or products of combustion cannot enter the baking chamber.

(12) "Steam-tube ovens" are ovens which are heated by a group of tubes which are partially filled with liquid and sealed at both ends. A small part of each tube is exposed to the heat of a furnace and the larger part placed inside the baking chamber. Heat is transmitted by evaporating liquid in the furnace end of the tube. Steam thus formed travels to the other end of the tube, where the steam condenses and returns to the furnace by gravity.

(13) "Indirect recirculating ovens" are ovens which are equipped with a gas tight duct system, a furnace, and a circulating fan. Gases of combustion are circulated through this enclosed system and mixed with fresh combustion gases generated by the burner in the combustion chamber. A vent or overflow removes a portion of the gases to compensate for the fresh gases added by the burner. No unburned gases or products of combustion have access to the baking chamber.

(14) "Electric ovens" are ovens which are heated entirely by passing an electric current through resistance elements.

(15) "NFPA" means National Fire Protection Association.

[Order 74-17, § 296-302-015, filed 5/6/74.]

**WAC 296-302-020 General machine guarding.** (1) Electrical grounding. The frame of each machine which is driven by an electric motor or has any electrical connection shall be effectively grounded.

(2) Gears. Refer to WAC 296-24-150, machinery and machine guarding of the general safety and health standards, chapter 296-24 WAC.

(3) Removable covers or guards. Any covers or guards which must be removed for cleaning and adjustment shall be made easily removable in order that they may be removed and replaced with the least effort.

(4) Ventilation through machine guards. Where it is necessary to guard motors or other equipment which require ventilation, guards should be so designed that they will not restrict the circulation of the air.

[Order 74-17, § 296-302-020, filed 5/6/74.]

**WAC 296-302-025 Flour-handling equipment-- Scope and application.** All sections of this chapter which include WAC 296-302-025 in the section number, apply to flour-handling equipment.

[Order 74-17, § 296-302-025, filed 5/6/74.]

**WAC 296-302-02501 General requirements for flour-handling.** (1) Wherever any of the various pieces of apparatus comprising a flour-handling system are run in electrical unity with one another the following safeguards shall apply:

(a) Each apparatus shall be safeguarded by a disconnecting means for the motor circuits as required by National Electrical Code - 1971 edition.

(b) Wherever a flour-handling system is of such size that the beginning of its operation is far remote from its final delivery end, all electric motors operating each apparatus comprising this system shall be controlled at each of two points, one located at each remote end, either of which will stop all motors.

(c) Motor control switches shall be capable of being locked in the open position.

(d) Control circuits for magnetic controllers shall be so arranged that the opening of any one of several limit switches, which may be on an individual unit, will serve to de-energize all of the motors of that unit.

(2) Removable covers on all flour-handling equipment shall be so designed that the lifting effort shall not be more than 50 pounds.

(3) Wherever flour-handling systems are of large construction, suitable walkways or platforms or both shall be constructed around and over bins and apparatus, in accordance with the applicable requirements of the general safety and health standards, chapter 296-24 WAC.

(a) All walkway surfaces shall be maintained in non-slip condition.

(b) Elevated walkways shall have railings and toeboards in compliance with applicable requirements of the general safety and health standards, chapter 296-24 WAC.

(c) All ladders leading to upper walkways shall be in accordance with the applicable requirements of the general safety and health standards, chapter 296-24 WAC.

(d) Wherever walkways are near the ceiling construction of the building, where obstruction to head room is lower than normal standing height, methods shall be provided to warn any occupant of the walkway. This should be done by means of "tell tales" or other suitable means located ahead of the obstruction. Suitable signs shall also be placed on walkways warning occupants of possible danger.

(4) All oscillating and vibrating sifters shall be protected with guard rails in compliance with applicable requirements of the general safety and health standards, chapter 296-24 WAC.

(5) All mechanical transmission shafting, gearing, and sprocket drives shall be completely guarded, preferably with dust-tight housing. Lubrication fittings shall extend to the outside of the guard.

(6) All guards shall be readily removable.

(7) All flour-handling equipment, each individual unit or the entire system collectively, shall be so constructed that all interior or exterior protruding corners are of a rounded nature.

(8) When Class II hazardous conditions prevail, electric motors, motor controllers, and switches shall be of the type approved for such locations in accordance with the requirements of the National Electrical Code - 1971 edition.

[Order 74-17, § 296-302-02501, filed 5/6/74.]

**WAC 296-302-02503 Bag chutes and bag lifts (bag-arm elevators).** (1) Bag chutes (gravity chutes for handling flour bags) shall be so designed so as to keep to a minimum the speed of flour bags. If the chute inclines more than 30° from the horizontal, there shall be an upturn at the lower end of the chute to slow down the bags.

(2) Bag-arm elevators with manual takeoff shall be designed to operate at a capacity not exceeding seven bags per minute. The arms on the conveyor chain shall be so spaced as to obtain the full capacity of the elevator with the lowest possible chain speed. There shall be an electric limit switch at the unloading end of the bag-arm elevator so installed as to automatically stop the conveyor chain if any bag fails to clear the conveyor arms.

(3) The conveyor chain on bag-arm elevators shall travel in a suitable structure and all drums shall be completely guarded, so that in case of a broken chain link the remainder of the chain will remain within its guides.

(4) Manlifts shall not be used in bakeries. Bag or barrel lifts shall not be used as manlifts.

[Order 74-17, § 296-302-02503, filed 5/6/74.]

(1989 Ed.)

**WAC 296-302-02505 Dumpbin and blender.** (1) The dumpbin or blender shall be constructed of metal or other nonsplintering material.

(2) Openings shall be protected by means of bars or grids. If grids are made of mesh, the openings shall be not more than 3 inches in either length or width. If parallel bars or rods are used, they shall be spaced not more than 3 inches apart on centers.

(3) Hinged dumpbin covers shall be provided with locks or latches to hold the covers in the open position, so that they will not accidentally fall down while the dumpbin is in operation.

(4) Dumpbins and blenders shall be so constructed that no separate pits in floors shall be required at the point which connects the final discharge to the usual elevator.

(5) All dumpbin and blender hoods shall be of sufficient capacity to prevent circulation of flour dust outside the hoods.

(6) All dumpbins shall be of such a height from the floor as to enable the operator to dump flour from bags, without causing undue strain or fatigue. Where the edge of any bin is more than 24 inches above the floor, a bag rest step shall be provided.

(7) A control device for stopping the dumpbin and blender shall be provided close to the operator's work station.

(8) A screen shall be provided in the suction nozzle over the bin or blender to prevent sacks that are being cleaned from getting into the rotor of the dust collecting fan.

[Order 74-17, § 296-302-02505, filed 5/6/74.]

**WAC 296-302-02507 Flour elevators.** (1) Flour elevators shall be constructed of metal or other nonsplintering material.

(2) All removable sections of the elevator casing shall be equipped with stationary clamps for quick removal, or shall be equipped with equivalent locking devices which contain no loose parts which may become detached from either the casing or the cover.

[Order 74-17, § 296-302-02507, filed 5/6/74.]

**WAC 296-302-02509 Bolting reels.** (1) Bolting reels shall be constructed of metal or other nonsplintering material, with the exception of the bolting cloth.

(2) Refuse tailing spouts shall be readily accessible and shall be located at a safe distance from moving parts.

[Order 74-17, § 296-302-02509, filed 5/6/74.]

**WAC 296-302-02511 Storage bins.** (1) Storage bins shall be constructed of metal or other nonsplintering material.

(2) Storage bins shall be provided with gaskets and locks or latches to keep the cover closed, or other equivalent devices in order to ensure the dust tightness of the cover. Covers at openings where an employee may enter the bin shall also be provided with a hasp and a lock, so

[Title 296 WAC—p 2121]

located that the employee shall lock the cover in the open position whenever it is necessary to enter the bin.

(3) Storage bins where the side is more than 5 feet in depth shall be provided with standard stationary safety ladders, both inside and outside, to reach from floor level to top of bin and from top of bin to inside bottom, keeping the ladder end away from the moving screw conveyor.

(4) Loading distribution conveyors shall be located in top of bin centrally unhooused, and all covers for entrance to the bins shall be located away from the loading distribution conveyor.

(5) An electric limit switch or other suitable protective device shall be provided in the top of the bin centrally over the loading screw conveyor on the opposite end of the flour entrance opening. It shall be so designed as to stop the loading screw if an excessive amount of flour is delivered to the bin.

(6) The main entrance cover of large storage bins located at the interior exit ladder shall be provided with an electric interlock for motors operating both feed and unloading screw, so that these motors cannot operate while the cover is open.

[Order 74-17, § 296-302-02511, filed 5/6/74.]

**WAC 296-302-02513 Screw conveyors.** (1) Screw conveyors shall be constructed of metal or other nonsplintering material.

(2) Each dead-end screw conveyor shall be provided with an overflow safety gate which will operate an electric limit switch to shut down the conveyor before dangerous pressure of material is built up at the dead end.

(3) The covers of all screw conveyors shall be made removable in convenient sections, held on with stationary clamps located at suitable intervals keeping all covers dust-tight. Where drop or hinged bottom sections are provided this provision shall not apply.

[Order 74-17, § 296-302-02513, filed 5/6/74.]

**WAC 296-302-02515 Sifters.** (1) Enclosures of all types of flour sifters shall be so constructed that they are dust-tight but readily accessible for interior inspection.

(2) Oscillating and vibrating sifters shall be so constructed that all moving parts are well within the outer frame of the apparatus.

(3) Refuse tailing spouts of all types of sifters shall be readily accessible and shall be located at a safe distance from moving parts.

[Order 74-17, § 296-302-02515, filed 5/6/74.]

**WAC 296-302-02517 Flour scales.** (1) Flour scales shall be constructed of metal or other nonsplintering material.

(2) Where a transparent covering is provided over dial scales it shall be made of a nonshatterable transparent material.

(3) Traveling or track-type flour scales shall be equipped with bar handles for moving same. The bar should be at least 1 inch in diameter. Trolley track wheels shall be guarded.

[Title 296 WAC—p 2122]

(4) All moving trolley wheels located within 8 feet 6 inches of floors or platforms shall be fully guarded on sides and ahead of rotating motion.

(5) The scale cutoff switch shall be totally enclosed and connected to the scale beam in such a manner as to protect the operator from contact.

(6) Where two or more scales are used on traveling flour scales, interlocks shall be provided so that the gate will not open unless the hopper is below.

[Order 74-15, § 296-302-02517, filed 5/6/74.]

**WAC 296-302-02519 Automatic flour gates.** Automatic flourgate equipment shall be constructed of metal or other nonsplintering material.

[Order 74-17, § 296-302-02519, filed 5/6/74.]

**WAC 296-302-03001 Horizontal dough mixers.** (1) Mixers with external power application shall have all belts, chains, gears, pulleys, sprockets, clutches, and other moving parts completely enclosed.

(2) Mixers with built-in power units shall have all drive elements enclosed in such a manner as to prevent injury to operators or maintenance personnel performing their normal duties.

(3) Each mixer shall be equipped with an individual motor and control, and with a conveniently located manual switch to prevent the mixer from being started in the usual manner while the machine is being serviced and cleaned.

(4) All electrical control stations shall be so located that the operator must be in full view of the bowl in its open position. Such controls, other than a stop switch, shall not be duplicated.

(5) All mixers with power and manual dumping arrangements shall be equipped with safety devices which shall:

(a) Engage both hands of the operator, when the agitator is in motion under power, and while the bowl is opened more than one-fifth of its total opening.

(b) Prevent the agitator from being started, while the bowl is more than one-fifth open, without engaging both hands of the operator;

(c) Permit the operator to have a full view of the bowl opening while he is in the act of maintaining operation of the agitator at any time while the bowl is more than one-fifth open.

(6) Mixers with power dumping devices shall be arranged so that the bowl opening cannot be closed beyond four-fifths of its total opening unless the operator maintains the control contact which causes the dump motor to complete the bowl closure. Alternatively the control may be so arranged that the operator must keep at least one hand engaged, by holding in a push button, during the entire closure of the mixing bowl.

(7) Mixers shall be provided with flour-gate operating mechanisms, ingredient openings, and water inlets, which can be conveniently manipulated by the operator from the normal area of activity (either platform or floor) without requiring abnormal reaching, or improvisations which might jeopardize his safety.



(8) Every mixer shall be equipped with a full enclosure over the bowl which is closed at all times while the agitator is in motion. Only minor openings in this enclosure, such as ingredient doors, flour inlets, etc., each representing less than 1 1/2 square feet in area, shall be capable of being opened while the mixer is in operation.

(9) No loose access doors and covers weighing more than 2 pounds shall be used on mixers. Such parts shall be hinged or otherwise held in proximity to the openings that they cover.

(10) Overhead covers or doors which are subject to accidental closure shall be counterbalanced to remain in an open position or provided with means to hold them open until positively released by the operator.

(11) Provision shall be made to bolt mixers solidly to the floor to prevent dislocation or excessive vibration. Open space between mixers and platforms which may endanger the operator shall be guarded.

(12) Mixers shall be installed only on substantial foundations which are capable of safely withstanding the live loads incurred in full-capacity mixing operations.

(13) Access for lubrication at all points shall be provided so as to avoid contact between the lubricating device or the operator's hands and any moving parts.

(14) Any device or mechanism used to return "sponges" to a mixer shall be so interlocked with the mixer as to prevent injury to the operator.

(15) No electrical pilot or control circuits shall be employed at a potential in excess of 240 volts.

(16) A motor-running overcurrent protective device shall be provided for each motor. Undervoltage protection shall be provided in all magnetic controllers.

(17) Positive means shall be provided to prevent application of pressure above the design maximum in all mixer cooling jackets.

(18) Valves and controls to regulate the coolant in mixer jackets shall be located so as to permit access by the operator without jeopardizing his safety.

[Order 74-17, § 296-302-03001, filed 5/6/74.]

**WAC 296-302-03003 Vertical mixers.** (1) Vertical mixers shall comply with WAC 296-302-03001 (1), (2), (3), (9) through (13), (15) through (17).

(2) Positive means shall be provided to prevent injury to the operator during speed-change manipulation.

(3) Bowl locking devices shall be of a positive type which require the attention of the operator for unlocking.

(4) Devices shall be made available for moving bowls weighing more than 80 pounds, with contents, into and out of the mixing position on the machine.

[Order 74-17, § 296-302-03003, filed 5/6/74.]

**WAC 296-302-035 Dividers.** (1) Pinch and shear points. All pinch points and shear points from reciprocating or rotating parts of the divider shall be enclosed or guarded, to protect the operator's hands and fingers from these hazards.

(2) Front guards. Guards at front of a divider shall be so arranged that the weight of dough can be adjusted without removing the guard.

(3) Rear of divider. The back of the divider shall have a complete cover to enclose all of the moving parts, or each individual part shall be enclosed or guarded to remove the separate hazards. The rear cover shall be provided with a limit switch in order that the machine cannot operate when this cover is open. The guard on the back shall be hinged so that it cannot be completely removed and if a catch or brace is provided for holding the cover open, it shall be designed so that it will not release due to vibrations or minor bumping whereby the cover may drop on an employee.

(4) Oil holes in knife. The oil holes in the knife at the back of the divider shall be of a maximum width opening of 1/4 inch so an employee's finger cannot go through the hole.

(5) Knife actuating arm. There shall be a saddle guard or other protective device on any elongated hole in the knife actuating arm at the back of the divider.

(6) Shear pins. Dividers shall be equipped with mechanical overload release devices such as shear pins.

[Order 74-17, § 296-302-035, filed 5/6/74.]

**WAC 296-302-040 Moulders.** (1) Hoppers. Mechanical feed moulders shall be provided with hoppers so designed and connected to the proofer that an employee's hands cannot get into the hopper where they will come in contact with the in-running rolls.

(2) Hand-fed moulders. Hand-fed moulders shall be provided with a belt-feed device or the hopper shall be extended high enough so that the hands of the operator cannot get into the feed rolls. The top edge of such a hopper shall be well rounded to prevent injury when it is struck or bumped by the employee's hand.

(3) Stopping devices. There shall be a stopping device within easy reach of the operator who feeds the moulder and another stopping device within the reach of the employee taking the dough away from the moulder.

(4) Cleanout holes. Machines shall be so designed or guarded that there is no shear point in close proximity to the cleanout holes.

(5) Rear of moulders. At the rear of moulders all revolving shafts shall have round corners or cylindrical surfaces, and all bolts shall be flush. Tie rods shall be far enough from revolving parts to prevent a shearing or pinching hazard.

(6) Adjustment crank. Where a removable crank is used to adjust the moulder for different sizes of loaf, brackets shall be provided on the side of the machine for holding the crank when it is not in use.

[Order 74-17, § 296-302-040, filed 5/6/74.]

**WAC 296-302-045 Manually fed dough brakes.** (1) Top-roll protection. The top roll shall be protected by a heavy gage metal shield extending over the roll to go within 6 inches of the hopper bottom board. The shield may be perforated to permit observation of the dough entering the rolls.

(2) Emergency stop bar. An emergency stop bar shall be provided, so located that the body will press against it if the operator should fall forward, and this pressure shall positively open a circuit which will deenergize the



drive motor in case of an emergency. In addition a magnetic, spring-set brake shall be deenergized at the same time, causing the rolls to stop instantly. The emergency stop bar shall be activated prior to each shift to check if it is functioning properly.

[Order 74-17, § 296-302-045, filed 5/6/74.]

**WAC 296-302-050 Miscellaneous equipment.** (1) Proof boxes. All door locks shall be operable both from within and outside the box. Guide rails shall be installed to center the rack as it enters, passes through, and leaves the proof box.

(2) Fermentation room. Fermentation room doors shall have nonshatterable wire glass or plastic panels for vision through doors.

(3) Troughs. Troughs shall be mounted on antifriction bearing casters thus making it possible for the operator to move and direct the motion of the trough with a minimum of effort.

(4) Hand trucks.

(a) Casters shall be set back from corners to be out of the way of toes and heels, but not far enough back to cause the truck to be unstable.

(b) A lock or other device shall be provided to hold the handle in vertical position when the truck is not in use.

(5) Lift trucks. A lock or other device shall be provided to hold the handle in vertical position when the truck is not in use.

(6) Racks.

(a) Sharp splintered or rough corners and edges shall be eliminated.

(b) Racks shall be equipped with handles so located with reference to the frame of the rack that no part of the operator's hands extends beyond the outer edge of the frame when holding onto the handles.

(c) Antifriction bearing casters shall be used to give the operator better control of the rack.

(d) End guards shall be used at shelf levels on proofing racks.

(7) Conveyors.

(a) Wherever a conveyor passes over a main aisleway, regularly occupied work area, or passageway, the underside of the conveyor shall be completely enclosed to prevent broken chains or other material from falling in the passageway or work area.

(b) Stop bumpers shall be installed on all delivery ends of conveyors, wherever manual removal of the product carried is practiced.

(c) All conveyors shall have stop buttons at all operating stations. In addition, emergency stop bars or switches shall be installed at any machine infeed location fed by the conveyor where pinch points exist.

(8) Overhead rail systems.

(a) Handles for operating devices for trolley switches which hang less than 6 feet 8 inches from the floor shall be of pliable material.

(b) Floor scales. Nonshatterable transparent material shall be used to cover dials.

(9) Dough chutes. The entrance to the chute shall be guarded so as to protect the employee from falling into

chute, stepping into chute, or tripping over too low an edge of the chute.

(10) Skids.

(a) All sharp corners or edges shall be eliminated on all metal skids.

(b) All edges and corners shall be protected on skids to prevent exposed splinters.

(11) Ingredient premixers, emulsifiers, etc.

(a) All top openings shall be provided with covers attached to the machines. These covers should be so arranged and interlocked that power will be shutoff whenever the cover is opened to a point where the operator's fingers might come in contact with the beaters.

(b) Portable electrical agitators for ingredient premixers shall have the attachment cord so wired that the agitator will be grounded whenever it is connected to a source of power.

(12) Chain tackle.

(a) All chain tackle shall be marked prominently, permanently, and legibly with maximum load capacity.

(b) All chain tackle shall be marked permanently, and legibly with minimum support specification.

(c) Safety hooks shall be used.

(13) Trough hoists, etc.

(a) All hoists shall be marked prominently, permanently, and legibly with maximum load capacity.

(b) All hoists shall be marked permanently and legibly with minimum support specifications.

(c) Safety catches shall be provided for the chain so that the chain will hold the load in any position.

(d) Safety hooks shall be used.

(14) Air-conditioning units.

(a) All sharp corners and edges shall be eliminated.

(b) On large units with doors to chambers large enough to be entered, all door locks shall be operable from both inside and outside.

(15) Pan washing tanks.

(a) Counter-balanced hinged covers, or sliding covers, shall be provided.

(b) The surface of the floor of the working platform shall be maintained in nonslip condition.

(c) Working platforms shall be kept at least 32 inches below the top of the tank or guardrail.

(d) All electrical sockets in pan washing rooms shall be nonmetallic and keyless and other electrical equipment shall be moisture proof.

(e) Power ventilated exhaust hoods shall be provided over the tanks.

(16) Pan washing machines. Sharp corners and edges shall be eliminated.

(17) Cake depositors. All pinch points shall be eliminated, guarded, or shielded so that hands and arms cannot reach these pinch points while the machine is in operation.

(18) Icing machines. All pinch points shall be eliminated, or provided with guards or shields so hands and arms cannot reach these pinch points while the machine is in operation.

(19) Bread coolers, conveyor type.

(a) All pinch points shall be eliminated or guarded.

(b) Stop bumpers on all delivery ends of conveyors shall be installed wherever manual removal of the product carried is practiced.

(20) Bread coolers, rack type.

(a) Guardrails shall be installed to the center rack as it enters and leaves the cooler.

(b) All door locks shall be operable from both within and outside the cooler.

(21) Bread and cake boxes, trays, etc.

(a) Sharp corners and edges shall be eliminated on metal parts.

(b) All wooden corners and edges shall be protected to prevent splinters.

(22) Doughnut machines. Separate flues shall be provided, (a) for venting vapors from the frying section, and (b) for venting products of combustion from the combustion chamber used to heat the fat.

(23) Open fat kettles.

(a) The floor around kettles shall be maintained in nonslip condition.

(b) Fire extinguishing devices suitable for Class-B fires shall be provided. See general safety and health standards, WAC 296-24-590.

(c) Goggles or face shields shall be provided to prevent injuries from hot fat splashes.

(d) The top of the kettle shall be not less than 36 inches above floor or working level.

(24) Steam kettles.

(a) Positive locking devices shall be provided to hold kettles in the desired position.

(b) Kettles with steam jackets shall be provided with safety valves in accordance with the ASME Pressure Vessel Code, section VIII, Unfired Pressure Vessels, 1968.

[Order 74-17, § 296-302-050, filed 5/6/74.]

**WAC 296-302-05501 Slicers.** (1) Sprockets, chains, and V-belt drives on slicers shall be completely enclosed.

(2) All slicing machines shall be provided with a mechanical device to push the last loaf through the slicer knives.

(3) The cover over the knife head of reciprocating-blade slicers shall be provided with an interlocking arrangement so that the machine cannot operate unless the cover is in place.

(4) On slicers with endless band knives, each motor shall be equipped with a magnet brake which operates whenever the motor is not energized. Each door, panel, or other point of access to the cutting blades shall be arranged by means of mechanical or electric interlocks so that the motor will be de-energized if all such access doors, panels, or access points are not closed.

(5) When it is necessary to sharpen slicer blades on the machine, a barrier shall be provided leaving only sufficient opening for the sharpening stone to reach the knife blades.

(6) Where pusher fingers attached to the feed chain enter the bed plate of the cross feed, the end guard shall be extended to cover the pinch point.

(7) Slicer wrapper conditions:

(a) Where the flight chain on the slicer turns under the bed plate on the crossfeed to the wrapper, a spring-hinged section of bed plate shall be provided so that there is no shear point between the flight chain and the bed plate.

(b) Wrapping and slicing machines obtained from separate manufacturers, shall be installed and connected so that the chains, sprockets, belts, and moving parts are guarded. Interconnections for the starting and stopping of such devices shall be employed.

(c) Mechanical control levers for starting and stopping both slicing machine conveyors and wrapping machines shall be extended or so located that an operator in one location can control both machines. Such levers should be provided wherever necessary, but these should be so arranged that there is only one station capable of starting the wrapping machine and conveyor assembly, and this starting station should be so arranged or guarded as to prevent accidental starting. The electric control station for starting and stopping the electric motor driving the wrapping machine and conveyor should be located near the clutch starting lever.

(d) The transfer chain shall be completely covered on all sides, not just on front and top.

[Order 74-17, § 296-302-05501, filed 5/6/74.]

**WAC 296-302-05503 Wrappers.** (1) Any hand wheel which may be provided in order to turn the wrapping machine over by hand and which may run continuously shall be a smooth, solid disk wheel.

(2) At the discharge end (or drive side) of the cross-feed conveyor there shall be either a one- or two-piece guard in front of the crossfeed chain.

(3) Electrical heaters on wrappers shall be protected by a cover plate properly separated or insulated from the heaters in order that accidental contact with this cover plate will not cause a burn to the operator.

(4) Electric wiring for the wrapper heaters shall be so arranged that a minimum number of wires are used to connect the movable heaters assembly to the permanent wiring of the machine. This wiring shall be heat-resisting type in accordance with the requirements of the National Electrical Code - 1971 Edition.

(5) Power-driven friction rollers used to feed paper into the wrapping machine shall be provided with a guard over the in-running nip point of the rubber rollers.

(6) The nip point, between the chain and sprocket of the loose wrap attachment, shall be completely enclosed or guarded on both sides in such a way that employee's fingers cannot get into this nip point.

(7) Sprocket, chain, and V-belt drives on wrappers shall be completely enclosed.

[Order 74-17, § 296-302-05503, filed 5/6/74.]

**WAC 296-302-060 Biscuit and cracker equipment.**

(1) Meal, peanut, and fig grinders.

(a) If the hopper is removable it shall be provided with an electric interlock so that the machine cannot be put in operation when the hopper is removed.

(b) Where grid guards cannot be used, feed conveyors to hoppers, or baffle-type hoppers, shall be provided. Hoppers in such cases shall be enclosed and provided with hinged covers, and equipped with electric interlock to prevent operation of the machine with the cover open.

(2) Sugar and spice pulverizers.

(a) All drive belts used in connection with sugar and spice pulverizers shall be grounded by means of metal combs or other effective means of removing static electricity. All pulverizing of sugar or spice grinding shall be done in accordance with NFPA 62-1967 (Standard for Dust Hazards of Sugar and Cocoa), NFPA 656-1959 (Standard for Dust Hazards in Spice Grinding Plants).

(b) Magnetic separators shall be provided to reduce fire and explosion hazards.

(3) Cheese, fruit, and food cutters. These machines shall be protected in accordance with the requirements of (1) of this section.

(4) Jam, icing, and marshmallow beaters of horizontal tub type. All top openings shall be provided with covers attached to the machines.

(5) Reversible dough brakes. Reversible brakes shall be provided with a guard or tripping mechanism on each side of the rolls. These guards shall be so arranged as to stop the machine or reverse the direction of the rolls so that they are outrunning if the guard is moved by contact of the operator.

(6) Cross-roll brakes. Cross-roll brakes shall be provided with guards that are similar in number and equal in effectiveness to guards on hand-fed brakes.

(7) Box- and roll-type dough sheeters.

(a) Sheet rolls shall be guarded at the point where the dough enters the rolls so that the operator's fingers cannot get into the nip point.

(b) Hoppers for sheeters shall have an automatic stop bar or automatic stopping device along the back edge of the hopper. If construction does not permit location at the back edge, the automatic stop bar or automatic stopping device shall be located where it will be most effective to accomplish the desired protection.

(8) Cutting and panning, embossing, peeling, bar, and frutana machines. (a) Roll stands, other than hand fed, shall be guarded at the point where the dough enters the rolls so that the operator's fingers cannot get into the nip points.

(b) Guards shall be provided at each side of the cutter to prevent hands from getting under the cutter.

(c) Reciprocating panner heads shall be guarded to protect the operator from being caught between moving and stationary parts.

(d) Motor control buttons shall be located within view of the cutting head.

(9) Rotary, die machines, pretzel rolling, and pretzel-stick extruding machines. Dough hoppers shall have the entire opening protected with grid-type guards to prevent the employee from getting his hands caught in moving parts, or the hopper shall be extended high enough so that the operator's hands cannot get into moving parts.

(10) Band ovens. Band ovens shall be so arranged, or guarded, that the operator cannot get caught at the nip

point between the band and the drive pulley or the takeup pulley, or between the oven conveyor and the oven frame.

(11) Wafer-cutting machines. These machines shall be so guarded that it will be impossible for employee's fingers or hands to come in contact with the saws or knives while feeding the machine.

(12) Pan cooling towers.

(a) Where pan cooling towers extend to two or more floors, a lockout switch shall be provided on each floor in order that mechanics working on the tower may positively lock the mechanism against starting. Only one start switch shall be used in the motor control circuit.

(b) All unused sides of pan cooling tower conveyors shall be enclosed or effectively guarded to a height of 7 feet above each floor.

(c) Wherever a pan cooling tower conveyor passes through a floor, the opening shall be protected by a standard railing and toeboard as defined by the general safety and health standards, chapter 296-24 WAC, or by other equivalent protection.

(d) Wherever a pan conveyor passes over a main aisleway, regularly occupied work area, or passageway, the underside of the conveyor shall be completely enclosed to prevent pans, broken chains, or other material from falling in the aisleway, work area or passageway.

(e) Sprocket wheels of pan conveyors shall be enclosed so that accidental contact cannot be made at the point where the chain comes in contact with the sprocket.

(f) Wherever conveyor bars, flights, and attachments pass in opposite directions within 6 inches of each other, a sheet metal partition or screen with openings no larger than one-half inch shall be placed between the conveyor chains which run in opposite directions.

(13) Chocolate melting, refining, and mixing kettles. Each kettle shall be provided with a cover to enclose the top of the kettle. The bottom outlet of each kettle shall be of such size and shape that the operator cannot reach in to touch the revolving paddle or come in contact with the shear point between the paddle and the side of the kettle.

(14) Caddie, cover, and box stitchers (wire stitchers). A guard shall be mounted on the stitching head to prevent operators from getting fingers caught between the stitching head and the clincher block.

(15) Carton-wrapping and bundling machines. The end seal drums on carton and bundling machines shall be provided with guards.

(16) Carton and lining feeding machines. Cutting knives shall be provided with a hinged hood to cover the knives. These guards shall be electrically interlocked to stop the machine if they are removed.

(17) Peanut cooling trucks. Mechanically operated peanut cooling trucks shall have a grid-type cover over the entire top.

[Order 74-17, § 296-302-060, filed 5/6/74.]

**WAC 296-302-065 Ovens—Scope and application.** All sections of this chapter which include WAC 296-302-065 in the section number, apply to ovens.

[Order 74-17, § 296-302-065, filed 5/6/74.]

**WAC 296-302-06501 General location.** (1) Ovens shall be located with due regard to the possibility of fire resulting from overheating or from the escape of gas or fuel oil and the possibility of injury to persons resulting from explosions.

(2) Ovens shall be built on noncombustible foundations; excepting that where unusual circumstances require that an oven be placed on a combustible floor, the sole of the oven itself shall be insulated and shall be separated from the floor by a ventilated air space of at least 3 inches. In no case shall the temperature of a combustible floor beneath an oven be permitted to exceed 160°F.

(3) Insulation shall be used in the crown of any oven, and the space above this crown shall be ventilated, to prevent the temperature of any combustible ceilings from rising above 200°F.

(4) Where oven ducts or stacks pass through combustible walls or ceilings, sufficient clearance and insulation shall be provided to keep the temperature of combustible material below 160°F.

(5) Columns or structural members of a building shall not pass through an oven. When such columns or structural members are closer than 6 inches to the inner shell of an oven, fireproof material shall be used and insulated in such a way that the temperature of the column or structural member will be kept below 160°F.

(6) Ovens shall be located so as to be accessible from all sides and adequately spaced to permit the proper functioning of explosion vents.

(7) Ovens shall be located so that possible fire or explosion will not expose groups of persons to possible injury. For this reason ovens shall not adjoin lockers, lunch or sales rooms, main passageways, or exits.

[Order 74-17, § 296-302-06501, filed 5/6/74.]

**WAC 296-302-06503 General requirements.** (1) Protecting devices shall be maintained and kept in working order.

(2) All safety devices on ovens shall be inspected at intervals of not less than twice a month by an especially appointed, properly instructed bakery employee, and not less than once a year by representatives of the oven manufacturers.

(3) Protection of gas pilot lights shall be provided when it is impracticable to protect the main flame of the burner and where the pilot flame cannot contact the flame electrode without being in the path of the main flame of the burner.

(a) Failure of any gas pilot shall automatically shut off the fuel supply to the burner.

(b) Ovens with multiple burners shall be equipped with individual atmospheric pilot lights where there is sufficient secondary air in the baking chamber and where gas is available, or else each burner shall be equipped with an electric spark-type ignition device.

(4) Burners of a capacity exceeding 150,000 b.t.u. per hour equipped with electric ignition shall be protected in addition by quick-acting combustion safeguards.

(a) The high-tension current for any electric spark-type ignition device shall originate in a power supply line

which is interlocked with the fuel supply for the oven in such a way that in case of current failure both the source of electricity to the high-tension circuits and the fuel supply shall be turned off simultaneously.

(b) All electric circuits in connection with ignition systems on ovens shall comply with the National Electrical Code 1971 Edition.

(c) Combustion safeguards used in connection with electric ignition systems on ovens shall be so designed as to prevent an explosive mixture from accumulating inside the oven before ignition has taken place.

(5) When fuel is supplied and used at line pressure, safety shutoff valves shall be provided in the fuel line leading to the burner.

(a) When fuel is supplied in excess of line pressure, safety shutoff valves shall be provided in the fuel line leading to the burners, unless the fuel supply lines are equipped with other automatic valves which will prevent the flow of fuel when the compressing equipment is stopped.

(b) The safety shutoff valve shall be positively tight and shall be tested at least twice monthly.

(c) Packing glands shall be designed so that the valve will not be made inoperative by excessive tightening of the packing gland.

(d) Electrically operated safety shutoff valves shall be normally closed and not depend on electricity for shutting off the fuel supply.

(e) A safety shutoff valve shall require manual operation for reopening after it has closed, or the electric circuit shall be so arranged that it will require a manual operation for reopening the safety shutoff valve.

(f) Manual reset-type safety shutoff valves shall be so arranged that they cannot be locked in an open position by external means.

(g) Where blowers are used for supplying the air for combustion the safety shutoff valve shall be interlocked so that it will close in case of air failure.

(h) Where gas or electric ignition is used, the safety shutoff valve shall close in case of ignition failure. On burners equipped with combustion safeguards, the valve shall close in case of burner flame failure.

(6) One main, manually operated, fuel shutoff valve shall be provided on each oven, and shall be located ahead of all other valves in the system.

(7) All individual gas or oil burners with a heating capacity over 150,000 b.t.u. per hour shall be protected by a safeguard which is actuated by the flame and which will react to flame failure in a time interval not to exceed 2 seconds. All safeguards, once having shut down a gas or oil burner, shall require manual resetting and starting of the burner or burners.

(8) Any space in an oven (except direct fired ovens) which could be filled with an explosive mixture shall be protected by explosion vents. Explosion vents shall be made of minimum weight consistent with insulation.

(a) Explosion doors which have a weight shall be attached by chains or similar means to prevent flying parts from injuring the personnel in case of an explosion.

(b) Where explosion vents are so located that flying parts or gases might endanger the personnel working on

or near the oven, internal or external protecting means shall be provided in the form of heavily constructed shields or deflectors made from noncombustible material.

(c) Specifically exempted from the provisions of these standards as contained in (8)(a) and (b) of this section are heating systems on ovens in which the fuel is admitted only to enclosed spaces, which shall have been tested to prove that their construction will resist repeated explosions without deformation.

(9) Flues and dampers.

(a) All ovens (except electrically heated) shall be properly and firmly connected to an active chimney or flue of ample size to carry away the flue gases.

(b) The chimney shall be preinspected after installation or repair to determine whether it is in suitable condition.

(c) The flue pipe or breeching shall be properly supported in all cases.

(d) Means shall be employed which will prevent the flue pipe or breeching from entering beyond the inner wall of the chimney flue.

(e) Flue pipe shall be cemented or otherwise sealed to the chimney wall so as to prevent infiltration of air.

(f) A flue damper or other equivalent means for regulating draft shall be installed on each oven, the proper operation of which depends on natural draft.

(g) Dampers, where used, shall be equipped with accessibly located minimum and maximum stops. The minimum stop for dampers shall be adjusted to obtain sufficient air for combustion at the minimum oven output. Where stack dampers are used in connection with oil- or gas-fired ovens, they shall be equipped with means to turn the burner off when the damper is closed.

(10) Where the initial pressure of the fuel is lower than the air pressure used for combustion, check valves shall be installed in the fuel line to prevent air from backing up into the fuel lines. For instance, in gas burner apparatus, which uses air at pressures exceeding the gas service pressure, a check valve shall be provided in the gas line next to the mixing device.

(11) Where the gas supply pressure is substantially higher than that at which the burners of an oven are designed to operate, a gas pressure regulator shall be employed.

(a) Gas pressure regulators, where used, shall maintain the gas pressure to the manifold within 10 percent of the operating pressure from maximum to minimum consumption rates.

(b) Regulators shall be of the spring-loaded, dead-weight, or pressure-balanced type. Spring- or weight-loaded regulators shall have springs or weights covered by suitable housing. Under no circumstances shall a weight and lever type of regulator be used.

(c) A gas pressure regulator, requiring access to atmosphere for successful operation, shall be vented to the outer air.

(d) A relief valve shall be placed on the outlet side of gas pressure regulators where gas is supplied at high pressure. The discharge from this valve shall be piped to the outside of the building.

(12) All chambers which have to be connected to the atmosphere, but are separated from any gaseous or other volatile fuel by a flexible membrane, as, for instance, a diaphragm, bellows, etc., shall be connected by a pipe of at least one-half inch size to the outside atmosphere. The outside end of this pipe shall be protected against flooding or accidental plugging by ice formation, insects, or other causes, by providing a "tee" with double elbow connections pointing downwards at the top of the pipe, and screened outlets. Where several of such chambers are used in close proximity, a common vent line may be used.

(13) Where accumulation of dust in the air supply might affect the proper functioning of mixing devices and burners, the air supply inlet shall be equipped with suitable air filters. A standby filter should be available to permit interchanging filters for cleaning purposes.

[Order 74-17, § 296-302-06503, filed 5/6/74.]

**WAC 296-302-06505 Construction.** (1) Structural parts of ovens shall be protected against corrosion or deterioration.

(2) Roofs and other parts of ovens shall be structurally strong enough to support the weight of persons who may be required to climb on top of ovens or inside of them.

[Order 74-17, § 296-302-06505, filed 5/6/74.]

**WAC 296-302-06507 Safeguards of mechanical parts.** (1) Emergency stop buttons shall be provided on mechanical ovens near the point where operators are stationed.

(2) All piping at ovens shall be tested to be gastight.

(a) Soldered pipe joints shall not be permitted in connection with ovens. Pipe joints may be either screwed, flanged, or welded, in connection with ovens where such pipes carry fuel or steam.

(b) All pipe and fittings used shall be of such schedule which will safely carry the pressure and be clear and free from cutter burrs and defects in structure or threading.

(3) Main shutoff valves, operable separately from any automatic valve, shall be provided to permit turning off the fuel or steam in case of an emergency.

(a) Main shutoff valves shall be located so that explosions, fires, etc., will not prevent access to these valves.

(b) Main shutoff valves shall be locked in the closed position when persons must enter the oven or when the oven is not in service.

[Order 74-17, § 296-302-06507, filed 5/6/74.]

**WAC 296-302-06509 Gas-burning systems.** (1) Liquefied petroleum gas shall be stored and distributed in accordance with the requirements of the general safety and health standards, chapter 296-24 WAC.

(b) Inspirators on atmospheric (low-pressure) gas-burning systems shall be so constructed and machined as to ensure correct alignment of the gas jet with the axis of the inspirator. Air adjustments or shutters on inspirators on atmospheric gas-burning systems shall either be

permanently fixed or else provided with a locking device to positively prevent accidental change of setting. The shutter shall be so located that adjustments can be made when the oven is in normal operating condition.

(3) Dampers controlling the draft on ovens equipped with atmospheric gas-burning systems shall be interconnected with the gas supply so that no gas can be admitted to the burners if the damper is closed.

(a) Atmospheric pipe burners extending into the baking chamber of ovens fired with atmospheric gas-burning systems shall have secondary air ducts installed below each burner and extending over its full length. Air inlets for these ducts shall be placed outside the baking chamber.

(b) Stack dampers on ovens equipped with atmospheric gas-burning systems shall have a hole of the following diameter:

Diameter of flue	Diameter of opening
3 to 5	1/2
6 to 10	1
11 to 15	1 1/2

Dimensions given in inches.

(4) Nozzle or blast burners on atmospheric gas-burning systems shall be equipped with gas pilots or electric ignition; with the exception that burners operated on a maximum-minimum flame or modulating principle which are equipped with quick acting combustion safeguards actuated by the main burner flame may be equipped with automatic or hand torch ignition to be used for initial lighting only.

(5) Burners of the perforated pipe, ribbon, slot, tip, or similar types, having many individual ports, shall be capable of maintaining a stable flame over the entire length (or surface) of the burner throughout the turn-down range and under all draft conditions which may arise in the operation of the oven, unless ignition of gas from every port shall immediately result from the ignition of gas at any single port, when gas is supplied to the burner at the highest and lowest rating of the burners.

(6) Premixed gas burners shall be so designed that the burner will not backfire or blow off within the operating range of the burner.

(a) Multiple port burners, such as ribbon, strip, or tip burners, when used on premixed gas systems, shall be capable of instant ignition of the burner over its entire length when operated within the proper range of the burner, either in a normal or steam-laden oven atmosphere or under any other oven conditions which might extinguish the flame.

(b) Where a number of premixed gas burners are connected to a single premixing device, each burner shall be equipped with electric or gas ignition.

(7) High-pressure inspirators (using gas at pressures exceeding 1 p.s.i.) shall be so constructed and machined as to insure perfect alignment of the gas jet with the axis of the inspirator.

(a) No high-pressure inspirator shall be installed with a valve or other obstruction between the inspirator and the burner.

(b) Each high-pressure inspirator shall have a gas adjustment consisting of a fixed replaceable orifice or an adjustable orifice. When an adjustable orifice is used, the adjusting screw shall be protected by a gas-tight plug.

(c) Air adjustments on high-pressure inspirators shall be provided with positive locking means.

(d) High-pressure inspirators shall be so located that air adjustments can be made during the operation of the oven.

(e) High-pressure inspirators shall be mounted in such a position that should a backfire occur, it cannot injure the operator or ignite any combustible material.

(f) High-pressure inspirators used on gas-burning systems, which are supplied under pressure with a partial mixture of air and gas instead of straight gas, shall not be used unless the amount of air mixed with the gas is sufficiently low to keep the mixture rich enough to be above the upper explosive limit.

(g) Low-pressure proportioning inspirating sets (using air at pressures from one-half to 1 1/2 p.s.i. and gas at or about atmospheric pressure) shall be equipped with a positive locking device on the adjustment for setting the gas-air ratio.

(8) Low-pressure proportioning inspirators equipped with zero governors, which do not compensate for any change in resistance in the mixture pipe, shall be installed so that there is no valve or other obstruction between the inspirators and the burners. Diaphragm air spaces of governors on low-pressure proportioning inspirating sets shall be vented to the outside of the building.

(9) Two-pipe systems: No valve or other obstruction shall be placed between the mixing valve and the burners on any two-pipe system which uses air and gas under pressure, unless the mixing valve is equipped with a device which automatically will prevent excessive pressure rise in the mixture pressures. Two-pipe systems shall be equipped with means for cleaning the air and gas before they enter the mixing valve.

[Order 74-17, § 296-302-06509, filed 5/6/74.]

**WAC 296-302-06511 Gas mixing machines.** (1) All burners supplied with complete mixture from the machine shall be equipped with flash and flame arrestors equipped with automatic shutoff valves actuated by heat. These controls shall be installed as close to the burners as practical and also at the outlet of the premixing machine ahead of the individual burner shutoffs to prevent the flame from reaching the mixture supply pipe.

(a) The main mixture lines and the gas machine proper shall be amply protected against fire or explosion hazard by flashback arrestors and relief vents or soft-heads located outside the building. Some gas mixing machines are used for partially premixing gas and air and supplying this mixture to high-pressure inspirators where additional air is entrained. If the gas-air ratio is such that the mixture remains so rich as to be above the upper explosive limit over the entire range of the machine, flash arrestors or explosion vents are not required. Positive means shall be provided which will prevent any



such gas mixing machine from producing an explosive mixture.

(b) All diaphragm or similar chambers shall be connected to the atmosphere outside of the building.

(c) An automatic safety shutoff valve shall be provided in the gas line leading to the mixing valve which will close the gas supply in case the suction disappears at the compressor inlet or the current to the compressor is shutoff.

(d) Air inlets to gas mixing machines shall be piped to a location outside the building and shall be located at a point protected against dust.

(2) No valve or obstruction shall be installed between mixing blowers and burners.

(a) Mixing blowers shall be so constructed that they will supply a mixture of air and gas that will not blow off or backfire over the entire range of adjustments.

(b) Mixing blowers shall be provided with a pressure regulator in the gas line at the inlet to the mixing valve (to prevent variations in the air-gas ratio).

(c) Housings of mixing blowers shall be constructed to withstand any possible internal explosion.

(d) Mixing blowers shall be provided with an automatic safety shutoff valve in the gas line leading to the blower, which the safety shutoff valve will close in case of failure of either gas pressure or electric current.

[Order 74-17, § 296-302-06511, filed 5/6/74.]

**WAC 296-302-06513 Oil-burning equipment.** (1) The storage and distribution of fuel oil in bakeries shall be arranged according to reference NFPA 31-1968 Standard for Installation of Oil Burning Equipment.

(2) Oil burners shall be of a type approved by Underwriters' Laboratories, Inc. (See WAC 296-24-006, of the general safety and health standards.)

(a) Each oil burner shall be equipped with an electric ignition or gas pilot.

(b) Oil burners shall be protected against flame failure and overflowing of oil by a quick-acting combustion safeguard operated by the main burner flame. The time interval between flame failure and fuel shutoff shall be short enough to prevent a dangerous accumulation of an explosive mixture or the entry of a dangerous amount of fuel oil into the heating system; with the exception that on ovens requiring 150,000 b.t.u. per hour or less any combustion safeguard listed by the Underwriters Laboratories, Inc., may be used. (See WAC 296-24-006, of the general safety and health standards.)

(c) The shutting off of the fuel supply shall be accomplished by stopping the individual burner pump equipped with a pressure cutoff valve, or by closing a suitable valve.

(d) Oil-fired ovens shall have dampers so arranged that a small amount of air is passed through the furnace at all times.

(e) Oil burners capable of being withdrawn from the furnace (for adjustment, etc.) shall be provided with an interlock which will prevent the burner from starting when in the withdrawn position.

(f) Preheating of oil, where necessary, shall be done by steam, hot water, or electric heater, and shall be

thermostatically controlled. Heaters shall be substantially constructed with all joints made oil tight. Thermometers shall be installed at accessible locations to indicate the temperature of the heated oil. Heaters shall be bypassed or provided with means to prevent abnormal pressure.

(g) Oil burners equipped with mechanical means for supplying air shall have an interlock between the air pressure and the oil supply so that the burner cannot operate unless air for proper combustion is available.

(3) High-pressure atomizing oil burners shall be provided with a pressure cutoff valve between the pump and the nozzle.

(4) Air atomizing burners equipped with maximum-minimum or modulating controls, and which are arranged to have the ignition turned off after initial lighting has been accomplished, shall be equipped with a quick-acting flame safeguard directly actuated by the main flame of the burner.

(5) Mechanical atomizing burners of the rotary type shall be operated on the on-off principle and shall be equipped with safeguards actuated by the main flame.

(6) Evaporator-type burners shall be installed in such a way that provision is made to open the draft damper before oil can be admitted to the burners.

(7) Burners supplied by "vapofiers" shall be equipped with a protected gas or electric pilot. In combination vapofier-gas heating systems, the burner shall be protected in accordance with the requirements of WAC 296-302-06509.

[Order 74-17, § 296-302-06513, filed 5/6/74.]

**WAC 296-302-06515 Solid-fuel firing equipment.**

(1) In solid-fuel firing systems proper draft shall be maintained at the stack as long as there is fuel in the furnace. All breachings and flues shall be kept in a tight and clean condition. Solid-fuel firing systems using forced draft shall have the air supply to the ash pit interconnected with the furnace in such a way that the air pressure is shut off when the furnace door is opened.

(2) Mechanical stokers.

(a) Fuel feed and air supply to mechanical stokers shall be interlocked in such a way that fuel cannot be fed without sufficient air being available.

(b) Dampers in mechanical-stoker fired systems shall be interlocked with the stoker in such a way that the stoker cannot be started unless the damper is open.

[Order 74-17, § 296-302-06515, filed 5/6/74.]

**WAC 296-302-06517 Electrical heating equipment.**

(1) All electrical equipment shall be built and installed according to the National Electrical Code - 1971 edition.

(2) Open heating elements inside the baking chamber shall be guarded against accidental touching by the product being baked, by the body of the operator, or by current-conducting implements which may be used.

(3) A main disconnect switch or circuit breaker shall be provided. This switch or circuit breaker shall be so located that it can be reached quickly and safely. The main switch or circuit breaker shall have provisions for



locking it in the open position if any work on the electrical equipment or inside the oven must be performed.

[Order 74-17, § 296-302-06517, filed 5/6/74.]

**WAC 296-302-06519 Direct-fired ovens.** (1) Direct-fired ovens shall be safeguarded against failure of fuel, air, or ignition.

(2) To prevent the possible accumulation of explosive gases from being ignited after a shutdown, all direct-fired ovens with a heating capacity over 150,000 b.t.u. per hour shall be ventilated before the ignition system, combustion air blower, and the fuel can be turned on. The prevention shall insure at least four complete changes of atmosphere in the baking chamber by discharging the oven atmosphere to the outside of the building and entraining fresh air into it. The prevention shall be repeated whenever the heating equipment is shut down by a safety device.

[Order 74-17, § 296-302-06519, filed 5/6/74.]

**WAC 296-302-06521 Direct recirculating ovens.** (1) Each circulating fan in direct recirculating ovens shall be interconnected with the burner in such a manner that the fuel is shut off by a safety valve when the fan is not running.

(2) The flame of the burner or burners in direct recirculating ovens shall be protected by a quick-acting flame-sensitive safeguard which will automatically shut off the fuel supply in case of burner failure.

(3) Direct recirculating ovens shall be equipped with ventilating devices.

(4) Fans in direct recirculating ovens shall be constructed of materials suitable for the temperatures at which they will operate and designed with an ample safety factor to prevent rupture of the wheel.

(5) Fan wheel in direct recirculating oven shall be protected against direct impingement of the flame of the burner or burners.

(6) Direct recirculating ovens, and particularly fans in and on such ovens, shall be protected from overheating by means of a temperature limiting device.

(7) When the burner or burners on direct recirculating ovens are mounted at elevated positions permanent steps shall be provided for safe and convenient access to the burner or burners.

[Order 74-17, § 296-302-06521, filed 5/6/74.]

**WAC 296-302-06523 Flue-type ovens.** (1) Flue-type ovens shall be operated in such a way that less than atmospheric pressure is maintained in the flues.

(2) Gas burners in flue-type ovens shall be protected against flame failure.

(3) Oil burners on flue-type ovens shall be equipped with combustion safeguards as listed by the Underwriters Laboratories, Inc.

(4) Solid-fuel stoker-fired flue-type ovens shall have the stack damper interlocked with the stoker so that the stoker cannot be operated when the damper is closed.

[Order 74-17, § 296-302-06523, filed 5/6/74.]

(1989 Ed.)

**WAC 296-302-06525 Indirect-fired multiple burner ovens.** (1) Indirect-fired multiple-burner ovens shall be equipped with safety shutoff valves which are interlocked with the ignition system, the air pressure and the gas pressure.

(2) Parts of enclosures reaching through the wall of indirect-fired multiple-burner ovens, and observation windows on such ovens, shall be tested at least once each year with repeated explosions, and afterward inspected for leaks.

[Order 74-17, § 296-302-06525, filed 5/6/74.]

**WAC 296-302-06527 Steam-tube ovens.** Steam-tube ovens shall be protected against overfiring (firing at an excessive rate) and overheating (heating to excessive temperatures) by devices which control the maximum amount of fuel admitted to the furnace and the maximum permissible temperature in the baking chamber.

[Order 74-17, § 296-302-06527, filed 5/6/74.]

**WAC 296-302-06529 Indirect recirculating ovens.** (1) Indirect recirculating ovens shall have all oil and gas burners equipped with quick-acting flame sensitive combustion safeguards.

(2) Duct systems in indirect-recirculating ovens shall be protected by explosion vents having a minimum total area of 1 square foot of vent to 15 cubic feet of total duct volume. These explosion vents shall be so located that they will not release hot gases or flying parts in the direction of an operator.

(3) Duct systems (in ovens) operating under pressure shall be tested for tightness in the initial starting of the oven and also at intervals not farther apart than 6 months.

(4) Fans and other parts in indirect recirculating ovens shall comply with requirements as listed under WAC 296-302-06521.

[Order 74-17, § 296-302-06529, filed 5/6/74.]

**WAC 296-302-06531 Electric ovens.** Electric ovens shall be installed, operated, and maintained in accordance with the National Electrical Code - 1971 edition.

[Order 74-17, § 296-302-06531, filed 5/6/74.]

## Chapter 296-303 WAC

### SAFETY STANDARDS FOR LAUNDRY MACHINERY AND OPERATIONS

#### WAC

- 296-303-010 Laundry machinery and operations—Scope and application.
- 296-303-01001 General industrial safety standards.
- 296-303-01003 Definitions.
- 296-303-020 Point-of-operation guards—Scope and application.
- 296-303-02001 Washroom machines.
- 296-303-02003 Starching and drying machines.
- 296-303-02005 Finishing machines.
- 296-303-02007 Miscellaneous machines and equipment.
- 296-303-025 Operating rules—Scope and application.
- 296-303-02501 General.
- 296-303-02503 Mechanical.
- 296-303-030 Moving parts.

[Title 296 WAC—p 2131]

296-303-040 Starting and stopping devices.

**WAC 296-303-010 Laundry machinery and operations—Scope and application.** This chapter applies to moving parts of equipment used in laundries and to conditions peculiar to this industry, with special reference to the point of operation of laundry machines. This chapter does not apply to dry-cleaning operations.

[Order 74-18, § 296-303-010, filed 5/6/74.]

**WAC 296-303-01001 General industrial safety standards.** (1) General. These standards shall be augmented by the Washington state general safety and health standards, and any other regulations of general application which are or will be made applicable to all industries.

(2) Additional requirements. The employer shall comply with the provisions of the standards referenced in this section. In the event of any conflict between this section and WAC 296-303-015 through 296-303-040, the requirements of WAC 296-303-015 through 296-303-040 shall apply. The provisions of this chapter shall prevail in the event of conflict with, or duplication of, provisions contained in chapter 296-24 and 296-62 WAC.

(a) Industrial lighting. American National Standard Practice for Industrial Lighting, ANSI A11.1-1965 (R-1970).

(b) Floor and wall openings, railings, and toeboards. American National Standard Safety Requirements for Floor and Wall Openings, Railings, and Toeboards, ANSI A13.1-1956.

(c) Identification of piping systems. American National Standard Safety Standard for Mechanical Power Transmission Apparatus, ANSI A13.1-1956.

(d) Mechanical power transmission apparatus. American National Standard Safety Standard for Mechanical Power Transmission Apparatus, ANSI B15.1-1971.

(e) Pressure piping—Power piping. American National Standard Code for Pressure Piping—Power Piping, ANSI B31.1.0-1967. Addenda to the American National Standard Code for Pressure Piping—Power Piping, ANSI B31.1.0a-1969.

(f) Sanitation. American National Standard Requirements for Sanitation in Places of Employment, ANSI Z4.1-1968.

(g) Local exhaust systems. American National Standard Fundamentals Governing the Design and Operation of Local Exhaust Systems, ANSI Z9.2-1960.

(h) Gas appliances and gas piping. American National Standard for the Installation of Gas Appliances and Gas Piping, ANSI Z21.30-1964.

(3) WAC 296-24-006 through 296-24-012 of the general safety and health standards, chapter 296-24 WAC, shall apply where applicable to this industry.

[Order 74-18, § 296-303-01001, filed 5/6/74.]

**WAC 296-303-01003 Definitions.** (1) "Laundry" means an establishment wherein the washing, ironing, or other finishing of clothes, or any other textiles is done,

[Title 296 WAC—p 2132]

but excluding printing, bleaching, dry cleaning, or dyeing of clothes or other textiles.

(2) "Marking machine" means a power-driven machine used for marking clothes or other textiles.

(3) "Washing machine" means a power-driven machine used for washing clothes or other textiles. It generally consists of a stationary case or shell inside of which is a revolving perforated cylinder.

(4) "Extractor" means a power-driven centrifugal machine used for removing surplus moisture from clothes or other textiles by centrifugal action.

(5) "Wringer" means one or more power-driven rolls used for removing surplus moisture from clothes or other textiles.

(6) "Starch mixer" means a power-driven machine used for mixing or processing starch.

(7) "Starching machine" means a power-driven machine used for the starching of clothes or other textiles.

(8) "Drying tumbler" means a machine within which clothes or other textiles are dried by air, and which usually consists of an enclosure inside of which is a revolving cylinder.

(9) "Shaker" (clothes tumbler) means a revolving cylinder used for shaking out clothes or other textiles.

(10) "Drying room" means an enclosure used for drying clothes or other textiles, and containing any power-driven mechanism.

(11) "Dampening machine" means a machine used for dampening clothes or other textiles.

(12) "Ironer" means a hand- or power-operated machine, with one or more rolls or heated surfaces in contact, used for ironing or smoothing clothes or other textiles.

(13) "Shaping machine" means a power-driven machine used to shape, mold, or otherwise finish clothes or other textiles; this term shall also include shaping tables, stands, or shelves upon which the machine may be mounted.

(14) "Sewing machine" means a machine used for sewing or stitching clothes or other textiles.

(15) "Guarded" means covered, shielded, fenced, enclosed, or otherwise protected by means of suitable covers or casings, barrier rails, safety bars, or screens, to eliminate the possibility of accidental contact with, or dangerous approach by, persons or objects.

(16) "Enclosed" means that the object or equipment or part thereof is so guarded that accidental contact at the point of danger, during the regular operation of the equipment, is not possible.

(17) "Safety interlock" means a device that will prevent the operation of the machine while the cover or door is open or unlocked and will hold the cover or door closed and locked while the basket or cylinder is in motion.

(18) "Moving parts" means gears, sprockets, revolving shafts, clutches, belts, pulleys, or other revolving or reciprocating parts that are attached to, or form an integral part of, a machine.

(19) "Power transmission" pertains to equipment such as shafting, gears, belts, pulleys, or other parts used for

transmitting power to the machine, and shall include prime movers.

(20) "Prime movers" includes steam, gas, oil, and air engines or motors, and steam and hydraulic turbines.

(21) "Point of operation" means the point or points at which clothes or other textiles are inserted or manipulated in the operation of the machine.

[Order 74-18, § 296-303-01003, filed 5/6/74.]

**WAC 296-303-020 Point-of-operation guards-- Scope and application.** All sections of this chapter which include WAC 296-303-020 in the section number apply to point-of-operation guards.

[Order 74-18, § 296-303-020, filed 5/6/74.]

**WAC 296-303-02001 Washroom machines.** (1) Marking machine. Each power marking machine shall be equipped with a spring-compression device of such design as to prevent injury to fingers, should they be caught between the marking plunger and platen; or the marking machine shall be equipped with a control mechanism that will require the simultaneous action of both hands to operate the machine; or there shall be a guard that will act as a barrier in front of, and which will prevent the operator's fingers from coming into contact with the marking plunger.

(2) Washing machine.

(a) Each washing machine shall be equipped with an interlocking device that will prevent the inside cylinder from moving under power when the outer door on the case or shell is open, and will also prevent the door from being opened while the inside cylinder is in motion. This device should not prevent the movement of the inner cylinder under the action of a hand-operated mechanism or under the operation of an "inching device."

(b) Each washing machine shall be provided with means for holding open the doors or covers of inner and outer cylinders or shells while being loaded or unloaded. Spring loaded devices are an acceptable means.

(3) Extractor.

(a) Each extractor shall be equipped with a metal cover.

(b) Each extractor shall be equipped with an interlocking device that will prevent the cover from being opened while the basket is in motion, and will also prevent the power operation of the basket while the cover is not fully closed and secured. This device should not prevent the movement of the basket by hand to ensure an even loading.

(c) Each extractor shall also be effectively secured in position on the floor or foundation so as to eliminate unnecessary vibrations, and shall not be operated at a speed greater than that given in the manufacturer's rating, which shall be stamped on the inside of the basket where it is easily visible, in letters not less than one-fourth inch in height. The maximum permissible speed shall be given in revolutions per minute.

(d) Each engine individually driving an extractor shall be provided with an engine stop approved as specified in WAC 296-24-006, of the general safety and health standards, and a speed-limit governor. It is suggested

that where an extractor is driven by a direct-current motor a "no field" release be installed to prevent overspeed, which may result from an open or broken field.

(4) Power wringer. Each power wringer shall be equipped with a safety bar or other guard across the entire front of the feed or first pressure rolls, so arranged that the striking of the bar or guard by the hand of the operator or other person will stop the machine.

[Order 74-18, § 296-303-02001, filed 5/6/74.]

**WAC 296-303-02003 Starching and drying machines.** (1) Starching machine (cylinder or box type). Each starching machine, cylinder or box type, shall be enclosed or guarded so as to prevent the operator or other person from coming into accidental contact with the cylinder or box while the machine is in motion.

(2) Drying-room fan. Each drying-room fan, any part of which is within 7 feet of the floor or working platform, shall be guarded with wire mesh or screen of not less than No. 16 gage, the openings of which will reject a ball one-half inch in diameter.

(3) Drying tumbler.

(a) Each drying tumbler shall be equipped with an interlocking device that will prevent the inside cylinder from moving under power when the outer door on the case or shell is open, and also prevent the door from being opened while the inside cylinder is in motion. This device should not prevent the movement of the inner cylinder under the action of a hand-operated mechanism or under the operation of an inching device.

(b) Each drying tumbler shall be provided with means for holding open the doors or covers of inner and outer cylinders or shells while being loaded or unloaded.

(4) Shaker (clothes tumbler).

(a) Each shaker or clothes tumbler of the single-cylinder type shall be equipped with a device that will automatically prevent the tumbler from moving while the door is open.

(b) The tumbler shall also be enclosed or guarded so as to prevent accidental contact by the operator or other person while the machine is in motion.

(c) Each shaker or clothes tumbler of the double-cylinder type shall be equipped with an interlocking device that will prevent the inside cylinder from moving when the outer door on the case or shell is open and will also prevent the door from being opened while the inside cylinder is in motion. This device should not prevent the movement of the inner cylinder under the action of a hand-operated mechanism or under the operation of an inching device.

(d) Each shaker or clothes tumbler of the double-cylinder type shall be provided with means for holding open the doors or covers of inner and outer cylinders or shells while being loaded or unloaded.

(5) Exception. Provisions of (3), (4)(a), (c) and (d) of this section shall not apply to shakeout or conditioning tumblers where the clothes are loaded into the open end of the revolving cylinder and are automatically discharged out of the opposite end.

[Order 74-18, § 296-303-02003, filed 5/6/74.]

**WAC 296-303-02005 Finishing machines.** (1) Dampening machine. Each roll-dampening machine shall be so equipped that the rolls will be entirely enclosed and so arranged as to prevent the fingers of the operator or other person from being caught between the rolls. This may be accomplished by:

(a) A slot or hopper;

(b) A rod or strip located directly in front of the feed and extending the full length of the rolls.

(2) Ironer.

(a) Each flat-work or collar ironer shall be equipped with a safety bar or other guard across the entire front of the feed or first pressure rolls, so arranged that the striking of the bar or guard by the hand of the operator or other person will stop the machine. The pressure rolls shall be covered or guarded so that the operator or other person cannot reach into the rolls without removing the guard. This may be either a vertical guard on all sides or a complete cover. If a vertical guard is used, the distance from the floor or working platform to the top of guard shall be not less than 6 feet.

(b) Each body-type ironer, roll or shoe type, including sleeve and band ironers, shall be equipped with a safety bar or other guard across the entire length of the feed roll or shoe, so arranged that the striking of the bar or guard by the hand of the operator or other person will stop the machine. The hot roll or shoe shall also be covered in such a way that the operator or other person cannot come into contact with the heated surfaces.

(c) Each combined rotary-bosom and coat ironer shall be equipped with a safety bar or other guard across the entire length of the feed roll or shoe, so arranged that the striking of the bar or guard by the hand of the operator or other person will stop the machine. The hot roll or shoe shall also be covered in such a way that the operator or other person cannot come into contact with the heated surfaces.

(d) Each ironing press (excluding hand or foot powered ones) shall be equipped with a guard or means that will prevent the fingers of the operator or other person from being caught between the ironing surfaces.

[Order 74-18, § 296-303-02005, filed 5/6/74.]

**WAC 296-303-02007 Miscellaneous machines and equipment.** (1) Sewing machine. Each sewing machine shall be equipped with a guard permanently attached to the machine, so that the operator's fingers cannot pass under the needle. It shall be of such form that the needle can be conveniently threaded without removing the guard. This requirement will not apply to domestic-type sewing machines having a presser-foot which is in the "down" position during operation of the machine.

(2) Exhaust or ventilating fans. Each exhaust or ventilating fan within seven feet of the floor or working platform shall be completely covered with wire mesh of not less than No. 16 gage, and with openings that will reject a ball one-half inch in diameter.

(3) Steam pipes.

(a) All steam pipes that are within seven feet of the floor or working platform, and with which the worker may come into contact, shall be insulated or covered

with a heat-resistive material or shall be guarded to prevent direct contact with the worker.

(b) Where pressure-reducing valves are used, one or more relief or safety valves shall be provided on the low-pressure side of the reducing valve, in case the piping or equipment on the low-pressure side does not meet the requirements for full initial pressure. The relief or safety valve shall be located adjacent to, or as close as possible to, the reducing valve. Relief and safety valves vented to the atmosphere shall be so constructed as to prevent injury or damage caused by fluid escaping from relief or safety valves. The vents shall be of ample size and as short and direct as possible. The combined discharge capacity of the relief valves shall be such that the pressure rating of the lower-pressure piping and equipment will not be exceeded if the reducing valve sticks or fails to open.

[Statutory Authority: Chapter 49.17 RCW. 89-11-035 (Order 89-03), § 296-303-02007, filed 5/15/89, effective 6/30/89; Order 74-18, § 296-303-02007, filed 5/6/74.]

**WAC 296-303-025 Operating rules—Scope and application.** All sections of this chapter which include WAC 296-303-025 in the section number apply to operating rules.

[Order 74-18, § 296-303-025, filed 5/6/74.]

**WAC 296-303-02501 General.** (1) Floors.

(a) The floors of every room in a laundry that are used for washing purposes shall be properly constructed of cement, tile, or similar material. The floors shall be watertight, free from projections, crevices, or dangerous gradients. They shall be maintained in good repair and so drained that no water may accumulate.

(b) The floors of every room except washrooms shall be constructed of hardwood or any impervious material, free from protruding nails, splinters, or loose boards, and shall be so maintained.

(2) Table tops, shelves, and machine woodwork. Table tops, shelves, and machine woodwork shall be constructed of materials properly surfaced, finished free from splinters, and so maintained.

(3) Markers. Markers and others handling soiled clothes shall be warned against touching the eyes, mouth, or any part of the body on which the skin has been broken by a scratch or abrasion; and they shall be cautioned not to touch or eat food until their hands have been thoroughly washed.

(4) Ventilation. Where artificial ventilation is necessary to the maintenance of comfortable working conditions, an adequate ventilating system shall be installed as specified in WAC 296-62-110 of the general occupational health standards.

(5) Instruction of employees. Employees shall be properly instructed as to the hazards of their work and be instructed in safe practices, by bulletins, printed rules, and verbal instructions.

[Order 74-18, § 296-303-02501, filed 5/6/74.]

**WAC 296-303-02503 Mechanical.** (1) Safety guards.

(a) No safeguard, safety appliance, or device attached to, or forming an integral part of any machinery shall be removed or made ineffective except for the purpose of making immediate repairs or adjustments. Any such safeguard, safety appliance, or device removed or made ineffective during the repair or adjustment of such machinery shall be replaced immediately upon the completion of such repairs or adjustments.

(b) No machine shall be operated until such repairs and adjustments have been made and the machine is in good working condition.

(2) Steam-pressure apparatus. Steam machines shall not be operated at a pressure above that given by the manufacturer's pressure rating as shown on name plate. If the steam source is at a pressure higher than that given by the manufacturer's rating, a stop valve, reducing valve, pressure gage, and safety valve shall be installed, in the order named, from the source. The safety valve shall be located in a nonhazardous place.

(3) Machine adjustments. No moving parts of any machine shall be oiled, cleaned, adjusted, or repaired while said machine is in operation or in motion except that the rolls of adjusting machines not equipped with hand-power means shall be operated at the slowest speed possible with an operator constantly at the starting mechanism.

(4) Extractors. Each extractor shall be dismantled and inspected at least once a year and, if necessary, repaired. Overdriven extractors, if provided with handholes through which basket and rings can be inspected, need not be dismantled.

[Order 74-18, § 296-303-02503, filed 5/6/74.]

**WAC 296-303-030 Moving parts.** (1) Machine guarding (other than point of operation). Moving parts of machines, such as gears, sprockets, belts, pulleys, and shafts, shall be guarded in accordance with the requirements of WAC 296-24-20507 through 296-24-20513, of the general safety and health standards.

(2) Prime-mover guarding. Moving parts of prime movers such as fly-wheels, cranks and connecting rods, tail rods or extension piston rods, and governor balls, shall be guarded in accordance with the requirements of WAC 296-24-20505, of the general safety and health standards.

[Order 74-18, § 296-303-030, filed 5/6/74.]

**WAC 296-303-040 Starting and stopping devices.**

(1) Each power-driven machine shall be provided with means for disconnecting from the source of power. Starting and stopping devices for machines shall be so located as to be operable from the front of the machine, and so constructed as to allow proper guarding of belts and pulleys.

(2) Doors of washing machines, extractors, and tumbler/shaker dryer machines, shall have a cut-off micro switch or other method to shut-off power when loading doors are opened, making inner cylinder, tumbler, or shaker mechanisms inoperative while the door is open. In those situations where the cylinder or mechanism continues to rotate/move, and present a hazard after the

power is off, an interlocking device, breaking switch, or a time-delay switch is additionally required to prevent injury.

[Statutory Authority: Chapter 49.17 RCW. 89-11-035 (Order 89-03), § 296-303-040, filed 5/15/89, effective 6/30/89; Order 74-18, § 296-303-040, filed 5/6/74.]

### Chapter 296-304 WAC

#### SAFETY STANDARDS FOR SHIP REPAIRING, SHIPBUILDING AND SHIP-BREAKING

##### WAC

- 296-304-010 Scope and application.
- 296-304-01001 Definitions.
- 296-304-01003 Reference specifications, standards, and codes.
- 296-304-020 Explosive and other dangerous atmospheres—Scope and application.
- 296-304-02001 Competent person.
- 296-304-02003 Precautions before entering.
- 296-304-02005 Cleaning and other cold work.
- 296-304-02007 Certification before hot work is begun.
- 296-304-02009 Maintaining gas free conditions.
- 296-304-02011 Warning signs.
- 296-304-030 Surface preparation and preservation—Scope and application.
- 296-304-03001 Toxic cleaning solvents.
- 296-304-03003 Chemical paint and preservative removers.
- 296-304-03005 Mechanical paint removers.
- 296-304-03007 Painting.
- 296-304-03009 Flammable liquids.
- 296-304-040 Welding, cutting and heating—Scope and application.
- 296-304-04001 Ventilation and protection in welding, cutting and heating.
- 296-304-04003 Fire prevention.
- 296-304-04005 Welding, cutting and heating in way of preservative coatings.
- 296-304-04007 Welding, cutting and heating of hollow metal containers and structures not covered by WAC 296-304-02003.
- 296-304-04009 Gas welding and cutting.
- 296-304-04011 Arc welding and cutting.
- 296-304-04013 Uses of fissionable material in ship-breaking, shipbuilding and ship repairing.
- 296-304-050 Scaffolds, ladders and other working surfaces—Scope and application.
- 296-304-05001 Scaffolds or staging.
- 296-304-05003 Ladders.
- 296-304-05005 Guarding of deck openings and edges.
- 296-304-05007 Access to vessels.
- 296-304-05009 Access to and guarding of dry docks and marine railings.
- 296-304-05011 Access to cargo spaces and confined spaces.
- 296-304-05013 Working surfaces.
- 296-304-060 General working conditions—Scope and application.
- 296-304-06001 Housekeeping.
- 296-304-06003 Illumination.
- 296-304-06005 Utilities.
- 296-304-06007 Work in confined or isolated spaces.
- 296-304-06009 Work on or in the vicinity of radar and radio.
- 296-304-06011 Work in or on lifeboats.
- 296-304-06013 Health and sanitation.
- 296-304-06015 First aid.
- 296-304-070 Gear and equipment for rigging and materials handling—Scope and application.
- 296-304-07001 Inspection.
- 296-304-07003 Ropes, chains and slings.
- 296-304-07005 Shackles and hooks.
- 296-304-07007 Chain falls and pull-lifts.
- 296-304-07009 Hoisting and hauling equipment.
- 296-304-07011 Use of gear.
- 296-304-07013 Qualifications of operators.

- 296-304-080 Tools and related equipment—Scope and application.  
 296-304-08001 General precautions.  
 296-304-08003 Portable electric tools.  
 296-304-08005 Hand tools.  
 296-304-08007 Abrasive wheels.  
 296-304-08009 Powder actuated fastening tools.  
 296-304-08011 Internal combustion engines, other than ship's equipment.  
 296-304-090 Personal protective equipment—Scope and application.  
 296-304-09001 Eye protection.  
 296-304-09003 Respiratory protection.  
 296-304-09005 Head, foot and body protection.  
 296-304-09007 Lifesaving equipment.  
 296-304-100 Ship's machinery and piping systems—Scope and application.  
 296-304-10001 Ship's boilers.  
 296-304-10003 Ship's piping systems.  
 296-304-10005 Ship's propulsion machinery.  
 296-304-10007 Ship's deck machinery.  
 296-304-110 Portable, unfired pressure vessels, drums and containers, other than ship's equipment—Scope and application.  
 296-304-11001 Portable air receivers and other unfired pressure vessels.  
 296-304-11003 Drums and containers.  
 296-304-120 Electrical machinery—Electrical circuits and distribution boards.  
 296-304-130 Gear certification—General provisions.  
 296-304-13001 Purpose and scope.  
 296-304-13003 Definitions of terms.  
 296-304-140 Procedure governing accreditation—Scope and application.  
 296-304-14001 Application for accreditation.  
 296-304-14003 Action upon application.  
 296-304-14005 Duration and renewal of accreditation.  
 296-304-14007 Criteria governing accreditation to certificate vessels' cargo gear.  
 296-304-14009 Voluntary amendment or termination of accreditation.  
 296-304-14011 Suspension or revocation of accreditation.  
 296-304-14013 Reconsideration and review.  
 296-304-150 Duties of persons accredited to certificate vessels' cargo gear—Scope and application.  
 296-304-15001 General duties—Exemptions.  
 296-304-15003 Recordkeeping and related procedures concerning records in custody of accredited persons.  
 296-304-15005 Recordkeeping and related procedures concerning records in custody of the vessel.  
 296-304-160 Certification of vessels' cargo gear—Scope and application.  
 296-304-16001 General.  
 296-304-16003 Initial tests of cargo gear and tests after alterations, renewals or repairs.  
 296-304-16005 Periodic tests, examinations and inspections.  
 296-304-16007 Heat treatment.  
 296-304-16009 Exemptions from heat treatment.  
 296-304-16011 Grace periods.  
 296-304-16013 Gear requiring welding.  
 296-304-16015 Damaged components.  
 296-304-16017 Marking and posting of safe working loads.  
 296-304-16019 Requirements governing braking devices and power sources.  
 296-304-16021 Means of derrick attachment.  
 296-304-16023 Limitations on use of wire rope.  
 296-304-16025 Limitations on use of chains.  
 296-304-170 Certification of vessels—Tests and proof loads—Heat treatment—Competent persons—Scope and application.  
 296-304-17001 Visual inspection before tests.  
 296-304-17003 Unit proof test—Winches, derricks and gear accessory thereto.  
 296-304-17005 Unit proof tests—Cranes and gear accessory thereto.  
 296-304-17007 Limitations on safe working loads and proof loads.  
 296-304-17009 Examinations subsequent to unit tests.  
 296-304-17011 Proof tests—Loose gear.  
 296-304-17013 Specially designed blocks and components.  
 296-304-17015 Proof tests—Wire rope.  
 296-304-17017 Proof tests after repairs or alterations.  
 296-304-17019 Order of tests.  
 296-304-17021 Heat treatment.  
 296-304-17023 Competent persons.  
 296-304-180 Accreditation to certificate shore-based equipment—Scope and application.  
 296-304-18001 Eligibility for accreditation to certificate shore-based material handling devices covered by chapter 296-56 WAC of the safety and health regulations for longshoring.  
 296-304-18003 Provisions respecting application for accreditation, action upon the application, and related matters.  
 296-304-190 Duties of persons accredited to certificate shore-based material handling devices—General duties, exemptions.  
 296-304-200 Certification of shore-based material handling devices—Scope and application.  
 296-304-20001 General provisions.  
 296-304-20003 Unit proof test and examination of cranes.  
 296-304-20005 Annual examination of cranes.  
 296-304-20007 Unit proof test and examination of derricks.  
 296-304-20009 Annual examination of derricks.  
 296-304-20011 Determination of crane or derrick safe working loads and limitations in absence of manufacturer's data.  
 296-304-20013 Safe working load reduction.  
 296-304-20015 Safe working load increase.  
 296-304-20017 Nondestructive examination.  
 296-304-20019 Wire rope.  
 296-304-20021 Heat treatment.  
 296-304-20023 Examination of bulk cargo loading or discharging spouts or suckers.  
 296-304-20025 Documentation.

**WAC 296-304-010 Scope and application.** (1) The provisions and standards of the general safety and health standards, chapter 296-24 WAC, and such other codes and standards as are promulgated by the division of industrial safety and health which are applicable to all industries, shall be applicable in the ship repairing, shipbuilding, or shipbreaking industries whenever the employees are covered under the Washington State Industrial Safety and Health Act, chapter 49.17 RCW. The rules of this chapter and the rules of the aforementioned chapter 296-24 WAC are applicable to all ship repairing, shipbuilding, and shipbreaking industries and operations, provided that such rules shall not be applicable to those operations under the exclusive safety jurisdiction of the federal government.

(2) The responsibility for compliance with these regulations is placed upon "employers" as defined in WAC 296-304-01001(3).

(3) It is not the intent of these regulations to place additional responsibilities or duties on owners, operators, agents or masters of vessels unless such persons are acting as employers, nor is it the intent of these regulations to relieve such owners, operators, agents or masters of vessels from responsibilities or duties now placed upon them by law, regulation or custom.

(4) The responsibilities placed upon the competent person herein shall be deemed to be the responsibilities of the employer.

(5) Safety standards for ship repairing, shipbuilding, and shipbreaking are written, promulgated, and applicable to workplace hazards found in shipyards and boatyards located on navigable waters, provided such installations are not under the exclusive safety jurisdiction



of the federal government or the United States Coast Guard. Such operations shall include adjoining shore installations such as wharves, drydocks, graving docks, terminals, building ways, marine railways, and other adjoining areas customarily used by the employer in ship repairing, shipbuilding, or shipbreaking operations.

(6) Small vessel manufacturing operations not located on navigable waters shall be cited from General safety and health standards, chapter 296-24 WAC.

[Statutory Authority: Chapter 49.17 RCW. 89-11-035 (Order 89-03), § 296-304-010, filed 5/15/89, effective 6/30/89; Order 75-6, § 296-304-010, filed 3/10/75; Order 74-25, § 296-304-010, filed 5/7/74.]

**WAC 296-304-01001 Definitions.** (1) "Shall" indicates provisions which are mandatory.

(2) "Director" means the director of the department of labor and industries.

(3) "Employer" means an employer any of whose employees are employed, in whole or in part, in ship repair or related employments as defined in these standards on the navigable waters of the United States, including dry docks, graving docks and marine railways.

(4) "Employee" means any ship repairman or other person engaged in ship repair or related employments on the navigable waters of the United States, including dry docks, graving docks and marine railways, other than the master, ship's officers, crew of the vessel, or any person engaged by the master to repair any vessel under 18 net tons.

(5) "Gangway" means any ramp-like or stair-like means of access provided to enable personnel to board or leave a vessel including accommodation ladders, gang-planks and brows.

(6) "Vessel" includes every description of watercraft or other artificial contrivance used, or capable of being used, as a means of transportation on water, including special purpose floating structures not primarily designed for or used as a means of transportation on water.

(7) For purposes of WAC 296-304-05007, the term "barge" means an unpowered, flat bottom, shallow draft vessel including scows, carfloats and lighters. For purposes of these standards, the term does not include ship shaped or deep draft barges.

(8) For purposes of WAC 296-304-05007, the term "river tow boat" means a shallow draft, low free board, self-propelled vessel designed to tow river barges by pushing ahead. For purposes of these standards, the term does not include other towing vessels.

(9) "Shipbreaking" means any breaking down of a vessel's structure for the purpose of scrapping the vessel, including the removal of gear, equipment or any component part of a vessel.

(10) "Shipbuilding" means the construction of a vessel, including the installation of machinery and equipment.

(11) "Ship repair" means any repair of a vessel including, but not restricted to, alterations, conversions, installations, cleaning, painting, and maintenance work.

(12)(a) For ship repairing, "related employments" means any employments performed as an incident to or

in conjunction with ship repair work, including, but not restricted to, inspection, testing and employment as a watchman.

(b) For shipbuilding, "related employment" means any employments performed as an incident to or in conjunction with shipbuilding work, including, but not restricted to inspection, testing trials and employment as a watchman.

(c) For shipbreaking, "related employments" means any employments performed as an incident to or in conjunction with shipbreaking work, including, but not restricted to inspection, survey and employment as a watchman.

(13) "Hazardous substance" means a substance which by reason of being explosive, flammable, poisonous, corrosive, oxidizing, irritant, or otherwise harmful is likely to cause injury.

(14) "Competent person" means one who is capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt corrective action to eliminate them.

(15) "Confined space" means any space having a limited means of egress which is subject to the accumulation of toxic or flammable contaminants or an oxygen deficient atmosphere. Confined spaces include, but are not limited to storage tanks, process vessels, bins, boilers, ventilation or exhaust ducts, sewers, underground utility vaults, tunnels, pipelines and open top spaces more than 4 feet in depth, such as pits, tubes, vaults and vessels.

(16) "Enclosed space" means any space, other than a confined space, which is enclosed by bulkheads and overhead. It includes cargo holds, tanks, quarters, and machinery and boiler spaces.

(17) "Hot-work" means riveting, welding, burning or other fire or spark producing operations.

(18) "Cold-work" means any work which does not involve riveting, welding, burning or other fire or spark producing operations.

(19) "Portable unfired pressure vessel" means any pressure container or vessel used aboard ship, other than the ship's equipment, containing liquids or gases under pressure, excepting pressure vessels built to ICC regulations under 49 CFR Part 78, Subparts C and H.

(20) "Powder actuated fastening tool" means a tool or machine which drives a stud, pin, or fastener by means of an explosive charge.

(21) For purposes of WAC 296-304-06013, the term "hazardous material" means a material which has one or more of the following characteristics: (a) Has a flash point below 140°F., closed cup, or is subject to spontaneous heating; (b) has a threshold limit value below 500 p.p.m. in the case of a gas or vapor, below 500 mg./m.<sup>3</sup> for fumes, and below 25 m.p.p.c.f. in case of a dust; (c) has a single dose oral LD<sub>50</sub> below 500 mg./kg.; (d) is subject to polymerization with the release of large amounts of energy; (e) is a strong oxidizing or reducing agent; (f) causes first degree burns to skin in short time exposure, or is systemically toxic by skin contact; or (g) in the course of normal operations, may produce dusts,



gases, fumes, vapors, mists, or smokes which have one or more of the above characteristics.

[Order 76-7, § 296-304-01001, filed 3/1/76; Order 74-25, § 296-304-01001, filed 5/7/74.]

**WAC 296-304-01003 Reference specifications, standards, and codes.** Specifications, standards, and codes of agencies of the U.S. government, to the extent specified in the text, form a part of these regulations. In addition, the specifications, standards, and codes of organizations which are not agencies of the U.S. government, in effect on the date of the promulgation of these regulations as listed below, to the extent specified in the text, form a part of these standards:

National Fire Protection Association, 60 Batterymarch Street, Boston, Mass. 02110,

Underwriters' Laboratories, Inc., 207 East Ohio Street, Chicago, Ill. 60611,

United States of America Standard Safety Code for Portable Wood Ladders, A14.1-1959, United States of America Standards Institute, Inc., 10 East 40th Street, New York, N.Y. 10016,

United States of America Standard Safety Code for Portable Metal Ladders, A14.2-1956, United States of America Standards Institute, Inc., 10 East 40th Street, New York, N.Y. 10016,

United States of America Standard Safety Code for Head, Eye, and Respiratory Protection, Z2.1-1959, United States of America Standards Institute, Inc., 10 East 40th Street, New York, N.Y. 10016,

American Society of Mechanical Engineers, Boiler and Pressure Vessel Code, Section VIII, Rules for Construction of Unfired Pressure Vessels, American Society of Mechanical Engineers, 345 East 47th Street, New York, N.Y. 10017,

Threshold Limit Values, American Conference of Governmental Industrial Hygienists, 1014 Broadway, Cincinnati, Ohio 45202,

United States of America Standards Safety Code for the Use, Care, and Protection of Abrasive Wheels, B7.1-1964, United States of America Standards Institute, Inc., 10 East 40th Street, New York, N.Y. 10016.

[Order 74-25, § 296-304-01003, filed 5/7/74.]

**WAC 296-304-020 Explosive and other dangerous atmospheres—Scope and application.** All sections of this chapter which include WAC 296-304-020 in the section number apply to explosive and other dangerous atmospheres.

(1) WAC 296-304-02003 to 296-304-02009 applies to ship repairing and shipbreaking.

(2) WAC 296-304-02011 applies to ship repairing.

[Order 74-25, § 296-304-020, filed 5/7/74.]

**WAC 296-304-02001 Competent person.** (1) Designation.

(a) For the purposes of these standards, one or more competent persons shall be designated by the employer in accordance with the applicable requirements of this section unless the requirements of this section are always

carried out by a National Fire Protection Association Certified Marine Chemist.

(2) Criteria. The following criteria shall guide the employer in designating employees as competent persons:

(a) Ability to understand the meaning of designations on certificates and of any qualifications relating thereto and to carry out any instructions, either written or oral, left by the National Fire Protection Association Certified Marine Chemist or person authorized by the U.S. Coast Guard referred to in WAC 296-304-02007.

(b) Ability to use and interpret the readings of an oxygen indicator and a combustible gas indicator. The ability to use and interpret the readings of a carbon monoxide indicator and a carbon dioxide indicator, if the operations involve such hazardous gases.

(c) Familiarity with an understanding of WAC 296-304-02001 through 296-304-04013 and 296-304-080 through 296-304-08011.

(i) Familiarity with the structure and knowledge of the location and designation of spaces of the types of vessels on which breaking work is done.

(d) Familiarity with the structure and knowledge of the location and designation of spaces of the types of vessels on which repair work is done.

(e) Capability to perform the tests and inspections required by these standards and to write the required logs.

(3) Logging of inspections and tests.

(a) When tests and inspections, required to be performed by a competent person by any provisions of these standards, are made, a record of the locations, operations performed and date, time, and results of the tests and any instructions resulting therefrom shall be recorded. A separate form shall be used for each vessel on which tests and inspections are made.

(b) This record shall be available for inspection in the immediate vicinity of the affected operations while they are in progress. This record or copy thereof shall be kept on file for a period of at least three months from the date of the completion of the job.

(c) A copy of any certificate issued in accordance with WAC 296-304-02007 and of any instructions issued by the National Fire Protection Association Certified Marine Chemist shall be kept on file with the log for a period of at least 3 months from the date of the completion of the job. The certificate and instructions issued by the person doing the fumigation referred to in WAC 296-304-02003 (2)(a)(ii) shall also be kept on file for a period of at least 3 months from the date of the completion of the job.

(4) Application. The provisions of WAC 296-304-02001 are intended to apply in their entirety to employers engaged in general shipbreaking, shipbuilding and ship repair work. They do not apply to employers whose work involves situations to which WAC 296-304-02001 through 296-304-04013 are not applicable, such as general cleaning work in which flammable and toxic atmospheres are not involved. Any employer whose work involves only certain portions of said sections, such as work on small craft in boat yards where only combustible gas indicator tests are necessary for fuel tank leaks

or when using flammable paints below decks, may designate persons as competent on the basis of the applicable portion of the criteria set forth in (2) of this section.

[Order 76-7, § 296-304-02001, filed 3/1/76; Order 74-25, § 296-304-02001, filed 5/7/74.]

**WAC 296-304-02003 Precautions before entering.**

**(1) Flammable atmospheres and residues.**

(a) Before employees are initially permitted to enter any of the ship's spaces designated in (1) and (2) of this section, the atmosphere within the space to be entered shall be tested by a competent person to determine the concentration of flammable vapors or gases within the space.

(i) Cargo spaces or other spaces containing or having last contained combustible or flammable liquids or gases in bulk.

(ii) Spaces immediately adjacent to those described in (1) of this section.

(b) If the tests indicate that the atmosphere in the space to be entered contains a concentration of flammable vapor or gas greater than 10 percent of the lower explosive limit, the space shall be ventilated to reduce the concentration below 10 percent of the lower explosive limit before men are permitted to enter.

(c) If the atmosphere in the space to be entered is found to contain a concentration of flammable vapor or gas below the level immediately dangerous to life as defined in WAC 296-304-09003 (2)(a), but above the threshold limit value, employees shall be protected in accordance with the requirements of WAC 296-304-09003 (1), and (3), (4), or (5), which ever is applicable.

**(2) Toxic atmospheres and residues.**

(a) Before employees are initially permitted to enter any of the ship's spaces designated in (1), (2) and (3) of this section, the atmosphere in the space to be entered shall be tested for toxic atmospheric contaminants, and the space inspected for the presence of toxic or corrosive residues by a marine chemist, industrial hygienist or other person qualified to make these tests and inspections.

(i) Cargo spaces or other spaces containing or having last contained bulk liquids, gases, or solids of a toxic, corrosive, or irritant nature.

(ii) Spaces which have been fumigated.

(iii) Spaces immediately adjacent to those described in (1) and (2) of this section.

(b) If the tests indicate that the atmosphere in the space to be entered contains a concentration of toxic contaminants above the level which is immediately dangerous to life, the space shall be ventilated to reduce the concentration below the level immediately dangerous to life as defined in WAC 296-304-09003 (2)(a).

(c) If the atmosphere in the space to be entered is found to contain a concentration of toxic contaminants below the level immediately dangerous to life as defined in WAC 296-304-02003 (2)(a), but above the threshold limit value, employees shall be protected in accordance with the requirements of WAC 296-304-09003 (1), and (3), (4), or (5), whichever is applicable.

(d) The person qualified to make the tests and inspections referred to in (1)(a) of this section shall make a record of the tests, inspections and instructions pertaining to (1)(c) and (2)(b) and (c) of this section, which shall be available for inspection and kept on file in accordance with WAC 296-304-02001 (3)(b).

**(3) Oxygen deficient atmospheres.**

(a) Before employees are initially permitted to enter any of the ship's spaces designated in (1) through (3) of this section, the atmosphere in the spaces to be entered shall be tested by a competent person with an oxygen indicator or other suitable device to ensure that it contains at least 16.5 percent oxygen.

(i) Spaces in which the tests required by (1) and (2) of this section indicate that no flammable or toxic contaminants are present in the atmosphere.

(ii) Compartments which have been sealed.

(iii) Spaces which have been coated and closed up.

(iv) Nonventilated compartments which have been freshly painted.

(b) Cargo spaces containing cargoes or residues of cargoes which absorb oxygen, such as scrap iron, fresh fruit and molasses, and various vegetable drying oils in bulk.

(b) If the tests indicate that the atmosphere in the space to be entered contains less than 16.5 percent oxygen, the space shall be ventilated until tests indicate an oxygen content above this level.

(4) Exceptions. In emergencies and in cases of work of brief duration necessary to accomplish the ventilation required or to start operations, work may be performed in atmospheres containing concentrations of flammable contaminants above the upper explosive limit or otherwise immediately dangerous to life, provided employees are protected in accordance with the requirements of WAC 296-304-09003 (1) and (2).

[Order 76-7, § 296-304-02003, filed 3/1/76; Order 74-25, § 296-304-02003, filed 5/7/74.]

**WAC 296-304-02005 Cleaning and other cold work.**

(1) Employees shall be permitted to perform manual cleaning to remove residue materials, scale, and debris or to perform other cold work in spaces described in WAC 296-304-02003 (1)(a)(i) and (ii) and (2)(a)(i) through (iii) before they have been certified as gas free only under the following conditions:

(a) Liquid residues of flammable and toxic materials shall be removed from the spaces as thoroughly as practicable before employees start actual cleaning operations in these spaces. Drippings and spills of these materials on deck or elsewhere alongside the vessel shall be cleaned up as the work progresses. Special care shall be taken to prevent the spilling or the draining of these materials into the water surrounding the vessel.

(b) Continuous natural or mechanical ventilation shall be provided to keep the concentration of flammable vapors below ten percent of the lower explosive limit in all parts of the space, provided that if, because of the high volatility of the residues, a uniform concentration of less than ten percent of the lower explosive limit cannot be achieved, sufficient exhaust ventilation shall be provided

to reduce the concentration to or below that level in the major portions of the compartment.

(c) Tests shall be made by a competent person prior to commencement of cold work and with sufficient frequency thereafter, in accordance with temperature, volatility of the residues and other existing conditions in and about the spaces, to ensure that the concentration stated in (1)(b) of this section is not exceeded.

(d) Cold work only shall be permitted.

(e) Tests shall be made by a competent person to ensure that the exhaust vapors from these spaces are not accumulating in other areas within or around the vessel, marine railway, dry-dock, graving dock, or under the pier where sources of ignition may be present. Should such accumulations be found, any sources of ignition within the affected area shall be removed or extinguished.

(2) Only approved explosion-proof, self-contained, battery-fed, portable lamps shall be used in spaces described in WAC 296-304-02007(1) before the spaces have been certified as "safe for men." Battery-fed, portable lamps bearing the approval of the Underwriters' Laboratories for use in Class I, Group D atmospheres, or approved as permissible by the U.S. Bureau of Mines, and such lamps listed by the U.S. Coast Guard as approved for such use are deemed to meet the requirements of this paragraph.

(3) Signs shall be posted on the open deck adjacent to the access to spaces described in WAC 296-304-02007(1) prohibiting smoking and the use of open flames.

(4) The metallic parts of air moving devices, including fans, blowers, and jet-type air movers, and all duct work shall be electrically bonded to the vessel's structure.

(5) All motors and control equipment shall be of the explosion-proof type. Fans shall have nonferrous blades. Portable air ducts shall also be of nonferrous materials. All motors and associated control equipment shall be properly maintained and grounded.

(6) In spaces described in WAC 296-304-02009(1) which have been certified "safe for men," either battery lamps or explosion-proof lights, approved by the Underwriters' Laboratories for use in Class I, Group D atmospheres, or approved as permissible by the U.S. Bureau of Mines or the U.S. Coast Guard, shall be used, provided the lights are mounted to the space openings from the exterior, or suspended within the space with the cables so led as to protect them from injury.

(7) In spaces certified "safe for fire" nonexplosion proof lights may be used.

[Order 74-25, § 296-304-02005, filed 5/7/74.]

**WAC 296-304-02007 Certification before hot work is begun.** (1) Employees shall not be permitted to engage in hot work or the use of powder actuated fastening tools in or on the following spaces, boundaries or pipe lines until a certificate setting forth that the hot work can be done in safety is issued. Such certificate shall be acceptable only if issued by a marine chemist certificated by the National Fire Protection Association, except that a

certificate issued by another person authorized by the U.S. Coast Guard pursuant to the provisions of 46 CFR 35.01-1 (c)(1) for tank vessels, 46 CFR 71.60-1 (c)(1) for passenger vessels, and 46 CFR 91.50-1 (c)(1) for cargo and miscellaneous vessels is acceptable for a particular inspection:

(a) On tank vessels.

(i) Within or on the boundaries of cargo tanks which have been used to carry combustible or flammable liquids and gases in bulk, or within spaces adjacent to such cargo tanks.

(ii) Within or on the boundaries of fuel tanks.

(iii) On pipe lines, heating coils, pumps, fittings, or other appurtenances connected to such cargo or fuel tanks.

(b) On dry cargo, miscellaneous and passenger vessels.

(i) Within or on the boundaries of cargo tanks which have been used to carry combustible or flammable liquids and gases in bulk.

(ii) Within spaces adjacent to cargo tanks which have been used to carry flammable gases, or liquids with a flash point below 150°F, except where the distance between such cargo tanks and the work to be performed is not less than twenty-five feet.

(iii) Within or on the boundaries of fuel tanks.

(iv) On pipe lines, heating coils, pumps, fittings, or other appurtenances connected to such cargo or fuel tanks.

(2) In dry cargo holds for which a marine chemist's certificate is not required by (1)(b)(ii) of this section, hot work may be performed only after a competent person has carefully examined the hold and found it to be free of flammable liquids, gases, and vapors. If flammable liquids, gases, or vapors are found, hot work shall not be performed within the space until the flammable liquids, gases, or vapors have been removed and a test indicates that the space is safe for fire.

(3) Before hot work is performed in engine room and boiler room spaces of any vessel for which a marine chemist's certificate is not required by the provision of (1) or in fuel tank and engine compartments of boats, the bilges shall be inspected and tested by a competent person to ensure that they are free of flammable liquids, gases, and vapors. If flammable liquids, gases, or vapors are found, hot work shall not be performed within the space until the flammable liquids, gases, or vapors have been removed and a test indicates that the space is safe for fire.

(4) Hot work in the open. Before hot work is performed from open decks or in tanks or compartments from which the overhead has been completely removed, on the boundaries of cargo spaces or other spaces containing or having last contained combustible or flammable liquids or gases in bulk, the following steps shall be taken:

(a) Tests shall be made by a competent person to determine the concentration of flammable vapors in these spaces. The permissible level of concentration of flammable vapors shall not exceed ten percent of the lower explosive limit in all parts of the spaces.

(b) When the tests indicate that a space contains a concentration of flammable vapors above the permissible concentration, the space shall be inerted with a non-flammable gas or with water, or sufficient ventilation shall be provided to reduce the concentration below the permissible level.

(c) When the bottom of a space contains flammable residues, it shall be flooded with water to cover all parts of the space to a depth of at least one foot unless the space is inerted.

[Order 76-7, § 296-304-02007, filed 3/1/76; Order 74-25, § 296-304-02007, filed 5/7/74.]

**WAC 296-304-02009 Maintaining gas free conditions.** The following rules shall apply in maintaining gas free conditions:

(1) Pipe lines which may convey hazardous substances into the spaces certified "Safe for men—Safe for fire" shall be disconnected or blanked off, or other positive means shall be used to prevent discharge of hazardous substances from entering the space. Manholes and other closures which were secured when tests were made shall remain secured. If such manholes or other closures are opened or any manipulation of valves takes place which tends to alter existing conditions, work in the affected spaces or areas shall be stopped and not resumed until such time as the area has been retested and again certified "Safe for men—Safe for fire" in accordance with the requirements of WAC 296-304-02007(1).

(2) Before hot work is commenced on the weather deck over spaces which, under these regulations, are not required to be gas freed or inerted, all valves, closures and vents, except those which are vented up masts, connecting with nongas free tanks or compartments below, shall be closed. Valves, closures and vents shall not be opened until hot work is completed unless the hot work is stopped and the work location posted as unsafe for fire. The latter notice shall not be removed nor hot work resumed until the area is again made safe.

(3) The employer shall inform masters and chief engineers of vessels of the provisions of this section and shall confirm that they are aware of their responsibilities for seeing that their crews understand and obey all warning signs, tags, and the limitations stated on the marine chemist's certificates.

(4) When conditions in a tank are such that there is a possibility of hazardous vapor being released from residues or other sources after a marine chemist's certificate has been issued, a competent person shall make tests to assure that the gas-free condition is maintained irrespective of whether hot work is being performed in the tank. When the competent person finds that atmospheric conditions have altered, work shall be stopped and a new marine chemist's certificate in accordance with the requirements of WAC 296-304-02007(1) shall be obtained before work is resumed.

(5) Before hot work is begun on any metal covered with preservative coatings the requirements of WAC 296-304-04005 shall be met.

[Order 76-7, § 296-304-02009, filed 3/1/76; Order 74-25, § 296-304-02009, filed 5/7/74.]

(1989 Ed.)

**WAC 296-304-02011 Warning signs.** (1) Except as provided in WAC 296-304-02011(3), all tanks, compartments, or spaces which have been certified "Safe for men—Not safe for fire," or "Not safe for men—Not safe for fire" shall be plainly and conspicuously marked with paint or signs indicating that no hot work shall be performed on such tanks, compartments, or spaces or in the vicinity thereof.

(2) Except as provided in WAC 296-304-02011(3), all tanks, compartments or spaces which have been inerted with gas or certified "Not safe for men—Safe for fire" shall be plainly and conspicuously marked with paint or signs indicating that the tank, compartment or space contains a gas which will not support life or is hazardous to employees.

(3) The warning marks or signs required by WAC 296-304-02011(1), need not be posted on individual tanks, compartments or spaces if the entire vessel has been certified "Safe for men—Not safe for fire," "Not safe for men—Not safe for fire," or if the entire vessel has been inerted or certified "Not safe for men—Safe for fire," and if a sign to this effect is conspicuously posted at the gangway and at all other means of access to the vessel.

[Order 74-25, § 296-304-02011, filed 5/7/74.]

**WAC 296-304-030 Surface preparation and preservation—Scope and application.** All sections of this chapter which include WAC 296-304-030 in the section number apply to surface preparation and preservation and WAC 296-304-03001 to 296-304-03009 applies only to shipbuilding and ship repairing.

[Order 74-25, § 296-304-030, filed 5/7/74.]

**WAC 296-304-03001 Toxic cleaning solvents.** (1) When toxic solvents are used, the employer shall employ one or more of the following measures to safeguard the health of employees exposed to these solvents.

(a) The cleaning operation shall be completely enclosed to prevent the escape of vapor into the working space.

(b) Either natural ventilation or mechanical exhaust ventilation shall be used to remove the vapor at the source and to dilute the concentration of vapors in the working space to a concentration which is safe for the entire work period.

(c) Employees shall be protected against toxic vapors by suitable respiratory protective equipment in accordance with the requirements of WAC 296-304-09003 (1) and (3) and, where necessary, against exposure of skin and eyes to contact with toxic solvents and their vapors by suitable clothing and equipment.

(2) The principles in the threshold limit values to which attention is directed in WAC 296-304-02005 and applicable sections in chapter 296-62 WAC will be used by the department of labor and industries in enforcement proceedings in defining a safe concentration of air contaminants.

(3) When flammable solvents are used, precautions shall be taken in accordance with the requirements of WAC 296-304-03009.

[Title 296 WAC—p 2141]

[Order 76-7, § 296-304-03001, filed 3/1/76; Order 74-25, § 296-304-03001, filed 5/7/74.]

**WAC 296-304-03003 Chemical paint and preservative removers.** (1) Employees shall be protected against skin contact during the handling and application of chemical paint and preservative removers and shall be protected against eye injury by goggles or face shields in accordance with the requirements of WAC 296-304-09001 (1) and (2).

(2) When using flammable paint and preservative removers precautions shall be taken in accordance with the requirements of WAC 296-304-03009.

(3) When using chemical paint and preservative removers which contain volatile and toxic solvents, such as benzol, acetone and amyl acetate, the provisions of WAC 296-304-03001 shall be applicable.

(4) When using paint and rust removers containing strong acids or alkalies, employees shall be protected by suitable face shields to prevent chemical burns on the face and neck.

(5) When steam guns are used, all employees working within range of the blast shall be protected by suitable face shields. Metal parts of the steam gun itself shall be insulated to protect the operator against heat burns.

[Order 74-25, § 296-304-03003, filed 5/7/74.]

**WAC 296-304-03005 Mechanical paint removers.**

(1) Power tools.

(a) Employees engaged in the removal of paints, preservatives, rusts or other coatings by means of power tools shall be protected against eye injury by goggles or face shields in accordance with the requirements of WAC 296-304-09001(1).

(b) All portable rotating tools used for the removal of paints, preservatives, rusts or other coatings shall be adequately guarded to protect both the operator and nearby workers from flying missiles.

(c) Portable electric tools shall be grounded in accordance with the requirements of WAC 296-304-08003 (1) and (2).

(d) In a confined space, mechanical exhaust ventilation sufficient to keep the dust concentration to a minimum shall be used, or employees shall be protected by respiratory protective equipment in accordance with the requirements of WAC 296-304-09003 (1) and (4).

(2) Flame removal.

(a) Hardened preservative coatings shall not be removed by flame in enclosed spaces unless the employees exposed to fumes are protected by air line respirators in accordance with the requirements of WAC 296-304-09003(1). Employees performing such an operation in the open air, and those exposed to the resulting fumes, shall be protected by a fume filter type respirator in accordance with requirements of WAC 296-304-09003 (1) and (4)(b)(iv).

(b) Flame or heat shall not be used to remove soft and greasy preservative coatings.

(3) Abrasive blasting.

(a) Equipment. Hoses and fittings used for abrasive blasting shall meet the following requirements:

(i) Hoses. Hose of a type to prevent shocks from static electricity shall be used.

(ii) Hose couplings. House lengths shall be joined by metal couplings secured to the outside of the hose to avoid erosion and weakening of the couplings.

(iii) Nozzles. Nozzles shall be attached to the hose by fittings that will prevent the nozzle from unintentionally becoming disengaged. Nozzle attachments shall be of metal and shall fit onto the hose externally.

(iv) Dead man control. A dead man control device shall be provided at the nozzle end of the blasting hose either to provide direct cutoff or to signal the pot tender by means of a visual and audible signal to cut off the flow, in the event the blaster loses control of the hose. The pot tender shall be available at all times to respond immediately to the signal.

(b) Replacement. Hoses and all fittings used for abrasive blasting shall be inspected frequently to insure timely replacement before an unsafe amount of wear has occurred.

(c) Personal protective equipment.

(i) Abrasive blasters working in enclosed spaces shall be protected by hoods and air fed respirators or by air helmets of a positive pressure type in accordance with the requirements of WAC 296-304-09003(1).

(ii) Abrasive blasters working in the open shall be protected as indicated in (1) except that when synthetic abrasives containing less than one percent free silica are used filter type respirators approved by the Bureau of Mines for exposure to lead dusts may be used in accordance with WAC 296-304-09003 (1) and (4).

(iii) Employees, other than blasters, including machine tenders and abrasive recovery men, working in areas where unsafe concentrations of abrasive materials and dusts are present shall be protected by eye and respiratory protective equipment in accordance with the requirements of WAC 296-304-09001 (1) and (2) and 296-304-09003 (1) and (4).

(iv) The blaster shall be protected against injury from exposure to the blast by appropriate protective clothing, including gloves.

(v) Since surges from drops in pressure in the hose line can be of sufficient proportions to throw the blaster off the staging, the blaster shall be protected by a safety belt and life line tied off to the ship or other structure when blasting is being done from elevations where adequate protection against falling cannot be provided by railings.

[Order 76-7, § 296-304-03005, filed 3/1/76; Order 74-25, § 296-304-03005, filed 5/7/74.]

**WAC 296-304-03007 Painting.** (1) Paints mixed with toxic vehicles or solvents.

(a) When paints mixed with toxic vehicles or solvents are sprayed, the following conditions shall apply:

(i) In confined spaces, employees continuously exposed to such spraying shall be protected by air line respirators in accordance with the requirements of WAC 296-304-09003(1).

(ii) In tanks or compartments, employees continuously exposed to such spraying shall be protected by air line

respirators in accordance with the requirements of WAC 296-304-09003(1). Where mechanical ventilation is provided, employees shall be protected by respirators in accordance with the requirements of WAC 296-304-09003 (1) and (3).

(iii) In large and well ventilated areas, employees exposed to such spraying shall be protected by respirators in accordance with the requirements of WAC 296-304-09003 (1) and (5).

(b) Where brush application of paints with toxic solvents is done in confined spaces, or other areas where lack of ventilation creates a hazard, employees shall be protected by filter respirators in accordance with the requirements of WAC 296-304-09003 (1) and (3).

(c) When flammable paints or vehicles are used, precautions shall be taken in accordance with the requirements of WAC 296-304-03009.

(d) The metallic parts of air moving devices, including fans, blowers, and jet-type air movers, and all duct work shall be electrically bonded to the vessel's structure.

(2) Paints and tank coatings dissolved in highly volatile, toxic and flammable solvents. Several organic coatings, adhesives and resins are dissolved in highly toxic, flammable and explosive solvents with flash points below 80° F. Work involving such materials shall be done only when all of the following special precautions have been taken:

(a) Sufficient exhaust ventilation shall be provided to keep the concentration of solvent vapors below ten percent of the lower explosive limit. Frequent tests shall be made by a competent person to ascertain the concentration.

(b) If the ventilation fails or if the concentration of solvent vapors rises above ten percent of the lower explosive limit, painting shall be stopped and the compartment shall be evacuated until the concentration again falls below ten percent of the lower explosive limit. If the concentration does not fall when painting is stopped, additional ventilation to bring the concentration down to ten percent of the lower explosive limit shall be provided.

(c) Ventilation shall be continued after the completion of painting until the space or compartment is gas free. The final determination as to whether the space or compartment is gas free shall be made after the ventilating equipment has been shut off for a least ten minutes.

(d) Exhaust ducts shall discharge clear of working areas and away from sources of possible ignition. Periodic tests shall be made to ensure that the exhausted vapors are not accumulating in other areas within or around the vessel or dry dock.

(e) All motors and control equipment shall be of the explosion-proof type. Fans shall have nonferrous blades. Portable air ducts shall also be of nonferrous materials. All motors and associated control equipment shall be properly maintained and grounded.

(f) Only nonsparking paint buckets, spray guns and tools shall be used. Metal parts of paint brushes and rollers shall be insulated. Staging shall be erected in a manner which ensures that it is nonsparking.

(g) Only explosion proof lights, approved by the Underwriters' Laboratories for use in Class I, Group D atmospheres, or approved as permissible by the U.S. Bureau of Mines or the U.S. Coast Guard, shall be used.

(h) A competent person shall inspect all power and lighting cables to ensure that the insulation is in excellent condition, free of all cracks and worn spots, that there are no connections within fifty feet of the operation, that lines are not overloaded, and that they are suspended with sufficient slack to prevent undue stress or chafing.

(i) The face, eyes, head, hands and all other exposed parts of the bodies of employees handling such highly volatile paints shall be protected. All footwear shall be nonsparking, such as rubbers, rubber boots or rubber soled shoes without nails. Coveralls or other outer clothing shall be of cotton. Rubber, rather than plastic gloves shall be used because of the danger of static sparks.

(j) No matches, lighted cigarettes, cigars, or pipes, and no cigarette lighters or ferrous articles shall be taken into the area where work is being done.

(k) All solvent drums taken into the compartment shall be placed on nonferrous surfaces and shall be grounded to the vessel. Metallic contact shall be maintained between containers and drums when materials are being transferred from one to another.

(l) Spray guns, paint pots, and metallic parts of connecting tubing shall be electrically bonded, and the bonded assembly shall be grounded to the vessel.

(m) All employees continuously in a compartment in which such painting is being performed, shall be protected by air line respirators in accordance with the requirements of WAC 296-304-09003(1) and by suitable protective clothing. Employees entering such compartments for a limited time shall be protected by filter cartridge type respirators in accordance with the requirements of WAC 296-304-09003 (1) and (5).

(n) All employees doing exterior paint spraying with such paints shall be protected by suitable filter cartridge type respirators in accordance with the requirements of WAC 296-304-09003 (1) and (5) and by suitable protective clothing.

[Order 76-7, § 296-304-03007, filed 3/1/76; Order 74-25, § 296-304-03007, filed 5/7/74.]

**WAC 296-304-03009 Flammable liquids.** (1) In all cases when liquid solvents, paint and preservative removers, paints or vehicles, other than those covered by WAC 296-304-03007(2), are capable of producing a flammable atmosphere under the conditions of use the following precautions shall be taken:

(a) Smoking, open flames, arcs and spark-producing equipment shall be prohibited in the area.

(b) Ventilation shall be provided in sufficient quantities to keep the concentration of vapors below ten percent of their lower explosive limit. Frequent tests shall be made by a competent person to ascertain the concentration.

(c) Scrapings and rags soaked with these materials shall be kept in a covered metal container.



(d) Only explosion proof lights, approved by the Underwriters' Laboratories for use in Class I, Group D atmospheres, or approved as permissible by the U.S. Bureau of Mines or the U.S. Coast Guard, shall be used.

(e) A competent person shall inspect all power and lighting cables to ensure that the insulation is in excellent condition, free of all cracks and worn spots, that there are no connections within fifty feet of the operation, that lines are not overloaded, and that they are suspended with sufficient slack to prevent undue stress or chafing.

(f) Suitable fire extinguishing equipment shall be immediately available in the work area and shall be maintained in a state of readiness for instant use.

[Order 74-25, § 296-304-03009, filed 5/7/74.]

**WAC 296-304-040** **Welding, cutting and heating--**  
**Scope and application.** All sections of this chapter which include WAC 296-304-040 in the section number apply to welding, cutting and heating.

[Order 74-25, § 296-304-040, filed 5/7/74.]

**WAC 296-304-04001** **Ventilation and protection in welding, cutting and heating.** (1) Mechanical ventilation requirements.

(a) For the purposes of this section, mechanical ventilation shall meet the following requirements:

(i) Mechanical ventilation shall consist of either general mechanical ventilation systems or local exhaust systems.

(ii) General mechanical ventilation shall be of sufficient capacity and so arranged as to produce the number of air changes necessary to maintain welding fumes and smoke within safe limits.

(iii) Local exhaust ventilation shall consist of freely movable hoods intended to be placed by the welder or burner as close as practicable to the work. This system shall be of sufficient capacity and so arranged as to remove fumes and smoke at the source and keep the concentration of them in the breathing zone within safe limits.

(iv) Contaminated air exhausted from a working space shall be discharged into the open air or otherwise clear of the source of intake air.

(v) All air replacing that withdrawn shall be clean and respirable.

(vi) Oxygen shall not be used for ventilation purposes, comfort cooling, blowing dust or dirt from clothing, or for cleaning the work area.

(2) Welding, cutting and heating in confined spaces.

(a) Except as provided in WAC 296-304-04001 (2)(c) and (3)(b), either general mechanical or local exhaust ventilation meeting the requirements of (1) of this section shall be provided whenever welding, cutting or heating is performed in a confined space.

(b) The means of access shall be provided to a confined space and ventilation ducts to this space shall be arranged in accordance with WAC 296-304-05011 (2)(a) and (b).

(c) When sufficient ventilation cannot be obtained without blocking the means of access, employees in the

confined space shall be protected by air line respirators in accordance with the requirements of WAC 296-304-09003(1), and an employee on the outside of such a confined space shall be assigned to maintain communication with those working within it and to aid them in an emergency.

(3) Welding, cutting or heating of metals of toxic significance.

(a) Welding, cutting or heating in any enclosed spaces aboard the vessel involving the metals specified in this subsection shall be performed with either general mechanical or local exhaust ventilation meeting the requirements of (1) of this section.

(i) Zinc-bearing base or filler metals or metals coated with zinc-bearing materials.

(ii) Lead base metals.

(iii) Cadmium-bearing filler materials.

(iv) Chromium-bearing metals or metals coated with chromium-bearing materials.

(b) Welding, cutting, or heating in any enclosed spaces aboard the vessel involving the metals specified in this subsection shall be performed with local exhaust ventilation in accordance with the requirements of (1) of this section or employees shall be protected by air line respirators in accordance with the requirements of WAC 296-304-09003(1).

(i) Metals containing lead, other than as an impurity, or metals coated with lead-bearing materials.

(ii) Cadmium-bearing or cadmium coated base metals.

(iii) Metals coated with mercury-bearing metals.

(iv) Beryllium-containing base or filler metals. Because of its high toxicity, work involving beryllium shall be done with both local exhaust ventilation and air line respirators.

(c) Employees performing such operations in the open air shall be protected by filter type respirators in accordance with the requirements of WAC 296-304-09003 (1) and (4)(b)(4), except that employees performing such operations on beryllium-containing base or filler metals shall be protected by air line respirators in accordance with the requirements of WAC 296-304-09003(1).

(d) Other employees exposed to the same atmosphere as the welders or burners shall be protected in the same manner as the welder or burner.

(4) Inert-gas metal-arc welding.

(a) Since the inert-gas metal-arc welding process involves the production of ultraviolet radiation of intensities of 5 to 30 times that produced during shielded metal-arc welding, the decomposition of chlorinated solvents by ultraviolet rays, and the liberation of toxic fumes and gases, employees shall not be permitted to engage in, or be exposed to the process until the following special precautions have been taken:

(i) The use of chlorinated solvents shall be kept at least two hundred feet from the exposed arc, and surfaces prepared with chlorinated solvents shall be thoroughly dry before welding is permitted on such surfaces.

(ii) Helpers and other employees in the area not protected from the arc by screening as provided in WAC



206-304-04011(5) shall be protected by filter lenses meeting the requirements of WAC 296-304-09001 (1) and (3). When two or more welders are exposed to each other's arc, filter lens goggles of a suitable type meeting the requirements of WAC 296-304-09001 (1) and (3) shall be worn under welding helmets or hand shields to protect the welder against flashes and radiant energy when either the helmet is lifted or the shield is removed.

(iii) Welders and other employees who are exposed to radiation shall be suitably protected so that the skin is covered completely to prevent burns and other damage by ultraviolet rays. Welding helmets and hand shields shall be free of leaks and openings, and free of highly reflective surfaces.

(iv) When inert-gas metal-arc welding is being performed on stainless steel, the requirements of (3)(b) of this section shall be met to protect against dangerous concentrations of nitrogen dioxide.

(5) General welding, cutting and heating.

(a) Welding, cutting and heating not involving conditions or materials described in (2), (3) or (4) of this section may normally be done without mechanical ventilation or respiratory protective equipment, but where, because of unusual physical or atmospheric conditions, an unsafe accumulation of contaminants exists, suitable mechanical ventilation or respiratory protective equipment shall be provided.

(b) Employees performing any type of welding, cutting or heating shall be protected by suitable eye protective equipment in accordance with the requirements of WAC 296-304-09001 (1) and (3).

(6) Residues and cargos of metallic ores.

(a) Residues and cargos of metallic ores of toxic significance shall be removed from the area or protected from the heat before welding, cutting or heating is begun.

[Order 74-25, § 296-304-04001, filed 5/7/74.]

**WAC 296-304-04003 Fire prevention.** (1) When hot work is performed below decks or in other situations in which accidental fire would jeopardize the safety of employees, the following precautions shall be taken.

(2) When practical, objects to be welded, cut or heated shall be moved to a designated safe location or, if the object to be welded, cut or heated cannot be readily moved, all movable fire hazards including residues of combustible bulk cargos in the vicinity shall be taken to a safe place.

(3) If the object to be welded, cut or heated cannot be moved and if all the fire hazards including combustible cargos cannot be removed, positive means shall be taken to confine the heat, sparks, and slag, and to protect the immovable fire hazards from them.

(4) No welding, cutting or heating shall be done where the application of flammable paints or the presence of other flammable compounds or of heavy dust concentrations creates a hazard.

(5) Suitable fire extinguishing equipment shall be immediately available in the work area and shall be maintained in a state of readiness for instant use. In addition, when hot work is being performed aboard a vessel and

pressure is not available on the vessel's fire system, an auxiliary supply of water shall be made available where practicable, consistent with avoiding freezing of the lines or hose.

(6) When the welding, cutting, or heating operation is such that normal fire prevention precautions are not sufficient, additional personnel shall be assigned to guard against fire while the actual welding, cutting, or heating operation is being performed and for a sufficient period of time after completion of the work to insure that no possibility of fire exists. Such personnel shall be instructed as to the specific anticipated fire hazards and how the fire fighting equipment provided is to be used.

(7) When welding, cutting or heating is performed on tank shells, decks, overheads and bulkheads, since direct penetration of sparks or heat transfer may introduce a fire hazard to an adjacent compartment, the same precautions shall be taken on the opposite side as are taken on the side on which the welding is being performed.

(8) In order to eliminate the possibility of fire in enclosed spaces as a result of gas escaping through leaking or improperly closed torch valves, the gas supply to the torch shall be positively shut off at some point outside the enclosed space whenever the torch is not to be used or whenever the torch is left unattended for a substantial period of time, such as during the lunch hour. Overnight and at the change of shifts the torch and hose shall be removed from the confined space. Open end fuel gas and oxygen hoses shall be immediately removed from enclosed spaces when they are disconnected from the torch or other gas consuming device.

(9) Vaporizing liquid extinguishers shall not be used in enclosed spaces.

(10) Except when the contents are being removed or transferred, drums, pails, and other containers which contain or have contained flammable liquids shall be kept closed. Empty containers shall be removed to a safe area apart from hot work operations, or open flames.

[Order 76-7, § 296-304-04003, filed 3/1/76; Order 74-25, § 296-304-04003, filed 5/7/74.]

**WAC 296-304-04005 Welding, cutting and heating in way of preservative coatings.** (1) Before welding, cutting or heating is commenced on any surface covered by a preservative coating whose flammability is not known, a test shall be made by a competent person to determine its flammability. Preservative coatings shall be considered to be highly flammable when scrapings burn with extreme rapidity.

(2) Precautions shall be taken to prevent ignition of highly flammable hardened preservative coatings. When coatings are determined to be highly flammable they shall be stripped from the area to be heated to prevent ignition. A 1 1/2-inch or larger fire hose with fog nozzle, which has been uncoiled and placed under pressure, shall be immediately available for instant use in the immediate vicinity, consistent with avoiding freezing of the hose.

(3) Protection against toxic preservative coatings. (a) In enclosed spaces all surfaces covered with toxic preservatives shall be stripped of all toxic coatings for a

distance of at least 4 inches from the area of heat application or the employees shall be protected by air line respirators meeting the requirements of WAC 296-304-09003(1).

(b) In the open air employees shall be protected by a filter type respirator in accordance with the requirements of WAC 296-304-09003 (1) and (4).

(4) Before welding, cutting or heating is commenced in enclosed spaces on metals covered by soft and greasy preservatives, the following precautions shall be taken:

(a) A competent person shall test the atmosphere in the space to ensure that it does not contain explosive vapors, since there is a possibility that some soft and greasy preservatives may have flash points below temperatures which may be expected to occur naturally. If such vapors are determined to be present, no hot work shall be commenced until such precautions have been taken as will ensure that the welding, cutting or heating can be performed in safety.

(b) The preservative coatings shall be removed for a sufficient distance from the area to be heated to ensure that the temperature of the unstripped metal will not be appreciably raised. Artificial cooling of the metal surrounding the heated area may be used to limit the size of the area required to be cleaned. The prohibition contained in WAC 296-304-03005 (2)(b) shall apply.

(5) Immediately after welding, cutting or heating is commenced in enclosed spaces on metal covered by soft and greasy preservatives, and at frequent intervals thereafter, a competent person shall make tests to ensure that no flammable vapors are being produced by the coatings. If such vapors are determined to be present, the operation shall be stopped immediately and shall not be resumed until such additional precautions have been taken as are necessary to ensure that the operation can be resumed safely.

[Order 74-25, § 296-304-04005, filed 5/7/74.]

**WAC 296-304-04007 Welding, cutting and heating of hollow metal containers and structures not covered by WAC 296-304-02003.** (1) Drums, containers, or hollow structures which have contained toxic or flammable substances shall, before welding, cutting, or heating is undertaken on them, either be filled with water or thoroughly cleaned of such substances and ventilated and tested.

(2) Before heat is applied to a drum, container, or hollow structure, a vent or opening shall be provided for the release of any built-up pressure during the application of heat.

(3) Before welding, cutting, heating or brazing is begun on structural voids such as skegs, bilge keels, fair waters, masts, booms, support stanchions, pipe stanchions or railings, a competent person shall inspect the object and, if necessary, test it for the presence of flammable liquids or vapors. If flammable liquids or vapors are present, the object shall be made safe.

(4) Objects such as those listed in (3) of this section shall also be inspected to determine whether water or other nonflammable liquids are present which, when

heated, would build up excessive pressure. If such liquids are determined to be present, the object shall be vented, cooled, or otherwise made safe during the application of heat.

(5) Jacketed vessels shall be vented before and during welding, cutting or heating operations in order to release any pressure which may build up during the application of heat.

[Order 76-7, § 296-304-04007, filed 3/1/76; Order 74-25, § 296-304-04007, filed 5/7/74.]

**WAC 296-304-04009 Gas welding and cutting.** (1) Transporting, moving and storing compressed gas cylinders.

(a) Valve protection caps shall be in place and secure. Oil shall not be used to lubricate protection caps.

(b) When cylinders are hoisted, they shall be secured on a cradle, slingboard or pallet. They shall not be hoisted by means of magnets or choker slings.

(c) Cylinders shall be moved by tilting and rolling them on their bottom edges. They shall not be intentionally dropped, struck, or permitted to strike each other violently.

(d) When cylinders are transported by vehicle, they shall be secured in position.

(e) Valve protection caps shall not be used for lifting cylinders from one vertical position to another. Bars shall not be used under valves or valve protection caps to pry cylinders loose when frozen. Warm, not boiling, water shall be used to thaw cylinders loose.

(f) Unless cylinders are firmly secured on a special carrier intended for this purpose, regulators shall be removed and valve protection caps put in place before cylinders are moved.

(g) A suitable cylinder truck, chain, or other steadying device shall be used to keep cylinders from being knocked over while in use.

(h) When work is finished, when cylinders are empty or when cylinders are moved at any time, the cylinder valves shall be closed.

(i) Acetylene cylinders shall be secured in an upright position at all times except, if necessary, for short periods of time while cylinders are actually being hoisted or carried.

(2) Placing cylinders.

(a) Cylinders shall be kept far enough away from the actual welding or cutting operation so that sparks, hot slag or flame will not reach them. When this is impractical, fire resistant shields shall be provided.

(b) Cylinders shall be placed where they cannot become part of an electrical circuit. Electrodes shall not be struck against a cylinder to strike an arc.

(c) Fuel gas cylinders shall be placed with valve end up whenever they are in use. They shall not be placed in a location where they would be subject to open flame, hot metal, or other sources of artificial heat.

(d) Cylinders containing oxygen or acetylene or other fuel gas shall not be taken into confined spaces.

(3) Treatment of cylinders.

(a) Cylinders, whether full or empty, shall not be used as rollers or supports.

(b) No person other than the gas supplier shall attempt to mix gases in a cylinder. No one except the owner of the cylinder or person authorized by him shall refill a cylinder. No one shall use a cylinder's contents for purposes other than those intended by the supplier. Only cylinders bearing Interstate Commerce Commission identification and inspection markings shall be used.

(c) No damaged or defective cylinder shall be used.

(4) Use of fuel gas. The employer shall thoroughly instruct employees in the safe use of fuel gas, as follows:

(a) Before connecting a regulator to a cylinder valve, the valve shall be opened slightly and closed immediately. (This action is generally termed "cracking" and is intended to clear the valve of dust or dirt that might otherwise enter the regulator.) The person cracking the valve shall stand to one side of the outlet, not in front of it. The valve of a fuel gas cylinder shall not be cracked where the gas would reach welding work, sparks, flame or other possible sources of ignition.

(b) The cylinder valve shall always be opened slowly to prevent damage to the regulator. To permit quick closing, valves on fuel gas cylinders shall not be opened more than 1 1/2 turns. When a special wrench is required, it shall be left in position on the stem of the valve while the cylinder is in use so that the fuel gas flow can be shut off quickly in case of emergency. In the case of a manifolded or coupled cylinders, at least one such wrench shall always be available for immediate use. Nothing shall be placed on top of a fuel gas cylinder, when in use, which may damage the safety device or interfere with the quick closing of the valve.

(c) Fuel gas shall not be used from cylinders through torches or other devices which are equipped with shut-off valves without reducing the pressure through a suitable regulator attached to the cylinder valve or manifold.

(d) Before a regulator is removed from a cylinder valve, the cylinder valve shall always be closed and the gas released from the regulator.

(e) If, when the valve on a fuel gas cylinder is opened, there is found to be a leak around the valve stem, the valve shall be closed and the gland nut tightened. If this action does not stop the leak, the use of the cylinder shall be discontinued, and it shall be properly tagged and removed from the vessel. In the event that fuel gas should leak from the cylinder valve rather than from the valve stem and the gas cannot be shut off, the cylinder shall be properly tagged and removed from the vessel. If a regulator attached to a cylinder valve will effectively stop a leak through the valve seat the cylinder need not be removed from the vessel.

(f) If a leak should develop at a fuse plug or other safety device, the cylinder shall be removed from the vessel.

(5) Fuel gas and oxygen manifolds.

(a) Fuel gas and oxygen manifolds shall bear the name of the substance they contain in letters at least one (1) inch high which shall be either painted on the manifold or on a sign permanently attached to it.

(b) Fuel gas and oxygen manifolds shall be placed in safe and accessible locations in the open air. They shall not be located within enclosed spaces.

(c) Manifold hose connections, including both ends of the supply hose that lead to the manifold, shall be such that the hose cannot be interchanged between fuel gas and oxygen manifolds and supply header connections. Adapters shall not be used to permit the interchange of hose. Hose connections shall be kept free of grease and oil.

(d) When not in use, manifold and header hose connections shall be capped.

(e) Nothing shall be placed on top of a manifold, when in use, which will damage the manifold or interfere with the quick closing of the valves.

(6) Hose.

(a) Fuel gas hose and oxygen hose shall be easily distinguishable from each other. The contrast may be made by different colors or by surface characteristics readily distinguishable by the sense of touch. Oxygen and fuel gas hoses shall not be interchangeable. A single hose having more than one gas passage, a wall failure of which would permit the flow of one gas into the other gas passage, shall not be used.

(b) When parallel sections of oxygen and fuel gas hose are taped together, not more than 4 inches out of 8 inches shall be covered by tape.

(c) All hose carrying acetylene, oxygen, natural or manufactured fuel gas, or any gas or substance which may ignite or enter into combustion or be in any way harmful to employees, shall be inspected at the beginning of each shift. Defective hose shall be removed from service.

(d) Hose which has been subjected to flashback or which shows evidence of severe wear or damage shall be tested to twice the normal pressure to which it is subject, but in no case less than two hundred psi. Defective hose or hose in doubtful condition shall not be used.

(e) Hose couplings shall be of the type that cannot be unlocked or disconnected by means of a straight pull without rotary motion.

(f) Boxes used for the stowage of gas hose shall be ventilated.

(7) Torches.

(a) Clogged torch tip openings shall be cleaned with suitable cleaning wires, drills or other devices designed for such purpose.

(b) Torches shall be inspected at the beginning of each shift for leaking shutoff valves, hose couplings, and tip connections. Defective torches shall not be used.

(c) Torches shall be lighted by friction lighters or other approved devices, and not by matches or from hot work.

(8) Pressure regulators. Oxygen and fuel gas pressure regulators including their related gauges shall be in proper working order while in use.

[Order 74-25, § 296-304-04009, filed 5/7/74.]

**WAC 296-304-04011 Arc welding and cutting. (1) Manual electrode holders.**

(a) Only manual electrode holders which are specifically designed for arc welding and cutting and are of a capacity capable of safely handling the maximum rated current required by the electrodes shall be used.

(b) Any current carrying parts passing through the portion of the holder which the arc welder or cutter grips in his hand, and the outer surfaces of the jaws of the holder, shall be fully insulated against the maximum voltage encountered to ground.

(2) Welding cables and connectors.

(a) All arc welding and cutting cables shall be of the completely insulated, flexible type, capable of handling the maximum current requirements of the work in progress, taking into account the duty cycle under which the arc welder or cutter is working.

(b) Only cable free from repair or splices for a minimum distance of ten feet from the cable end to which the electrode holder is connected shall be used, except that cables with standard insulated connectors or with splices whose insulating quality is equal to that of the cable are permitted.

(c) When it becomes necessary to connect or splice lengths of cable one to another, substantial insulated connectors of a capacity at least equivalent to that of the cable shall be used. If connections are effected by means of cable lugs, they shall be securely fastened together to give good electrical contact, and the exposed metal parts of the lugs shall be completely insulated.

(d) Cables in poor repair shall not be used. When a cable, other than the cable lead referred to in (b), becomes worn to the extent of exposing bare conductors, the portion thus exposed shall be protected by means of rubber and friction tapes or other equivalent insulation.

(3) Ground returns and machine grounding.

(a) A ground return cable shall have a safe current carrying capacity equal to or exceeding the specified maximum output capacity of the arc welding or cutting unit which it services. When a single ground return cable services more than one unit, its safe current carrying capacity shall equal or exceed the total specified maximum output capacities of all the units which it services.

(b) Structures or pipe lines, except pipelines containing gases or flammable liquids or conduits containing electrical circuits, may be used as part of the ground return circuit, provided that the pipe or structure has a current carrying capacity equal to that required by (2).

(c) When a structure or pipe line is employed as a ground return circuit, it shall be determined that the required electrical contact exists at all joints. The generation of an arc, sparks or heat at any point shall cause rejection of the structure as a ground circuit.

(d) When a structure or pipe line is continuously employed as a ground return circuit, all joints shall be bonded, and periodic inspections shall be conducted to ensure that no condition of electrolysis or fire hazard exists by virtue of such use.

(e) The frames of all arc welding and cutting machines shall be grounded either through a third wire in the cable containing the circuit conductor or through a separate wire which is grounded at the source of the current. Grounding circuits, other than by means of the vessel's structure, shall be checked to ensure that the circuit between the ground and the grounded power conductor has resistance low enough to permit sufficient

current to flow to cause the fuse or circuit breaker to interrupt the current.

(f) All ground connections shall be inspected to ensure that they are mechanically strong and electrically adequate for the required current.

(4) Operating instructions. Employers shall instruct employees in the safe means of arc welding and cutting as follows:

(a) When electrode holders are to be left unattended, the electrodes shall be removed and the holders shall be so placed or protected that they cannot make electrical contact with employees or conducting objects.

(b) Hot electrode holders shall not be dipped in water, since to do so may expose the arc welder or cutter to electric shock.

(c) When the arc welder or cutter has occasion to leave his work or to stop work for any appreciable length of time, or when the arc welding or cutting machine is to be moved, the power supply switch to the equipment shall be opened.

(d) Any faulty or defective equipment shall be reported to the supervisor.

(5) Shielding. Whenever practicable, all arc welding and cutting operations shall be shielded by noncombustible or flame-proof screens which will protect employees and other persons working in the vicinity from the direct rays of the arc.

[Order 74-25, § 296-304-04011, filed 5/7/74.]

**WAC 296-304-04013 Uses of fissionable material in ship-breaking, shipbuilding and ship repairing.** (1) In ship-breaking, shipbuilding and ship repairing and related activities involving the use of and exposure to sources of ionizing radiation not only on conventionally powered but also on nuclear powered vessels, the applicable provisions of the Atomic Energy Commission's Standards for Protection Against Radiation (10 CFR Part 20), relating to protection against occupational radiation exposure, shall apply.

(2) Any activity which involves the use of radioactive material, whether or not under license from the Atomic Energy Commission, shall be performed by competent persons specially trained in the proper and safe operation of such equipment. In the case of materials used under commission license, only persons actually licensed, or competent persons under direction and supervision of the licensee, shall perform such work.

[Order 76-7, § 296-304-04013, filed 3/1/76; Order 74-25, § 296-304-04013, filed 5/7/74.]

**WAC 296-304-050 Scaffolds, ladders and other working surfaces--Scope and application.** All sections of this chapter which include WAC 296-304-050 in the section number apply to scaffolds, ladders and other working surfaces.

[Order 74-25, § 296-304-050, filed 5/7/74.]

**WAC 296-304-05001 Scaffolds or staging.** (1) General requirements.

(a) All scaffolds and their supports whether of lumber, steel or other material, shall be capable of supporting the load they are designed to carry with a safety factor of not less than four.

(b) All lumber used in the construction of scaffolds shall be spruce, fir, long leaf yellow pine, Oregon pine or wood of equal strength. The use of hemlock, short leaf yellow pine, or short fiber lumber is prohibited.

(c) Lumber dimensions as given are nominal except where given in fractions of an inch.

(d) All lumber used in the construction of scaffolds shall be sound, straight-grained, free from cross grain, shakes and large, loose or dead knots. It shall also be free from dry rot, large checks, worm holes or other defects which impair its strength or durability.

(e) Scaffolds shall be maintained in a safe and secure condition. Any component of the scaffold which is broken, burned or otherwise defective shall be replaced.

(f) Barrels, boxes, cans, loose bricks, or other unstable objects shall not be used as working platforms or for the support of planking intended as scaffolds or working platforms.

(g) No scaffold shall be erected, moved, dismantled or altered except under the supervision of competent persons.

(h) No welding, burning, riveting or open flame work shall be performed on any staging suspended by means of fiber rope.

(i) Lifting bridles on working platforms suspended from cranes shall consist of four legs so attached that the stability of the platform is assured.

(j) Unless the crane hook has a safety latch or is moused, the lifting bridles on working platforms suspended from cranes shall be attached by shackles to the lower lifting block or other positive means shall be taken to prevent them from becoming accidentally disengaged from the crane hook.

#### (2) Independent pole wood scaffolds.

(a) All pole uprights shall be set plumb. Poles shall rest on a foundation of sufficient size and strength to distribute the load and to prevent displacement.

(b) In light-duty scaffolds not more than 24 feet in height, poles may be spliced by overlapping the ends not less than 4 feet and securely nailing them together. A substantial cleat shall be nailed to the lower section to form a support for the upper section except when bolted connections are used.

(c) All other poles to be spliced shall be squared at the ends of each splice, abutted, and rigidly fastened together by not less than two cleats securely nailed or bolted thereto. Each cleat shall overlap each pole end by at least 24 inches and shall have a width equal to the face of the pole to which it is attached. The combined cross sectional area of the cleats shall be not less than the cross sectional area of the pole.

(d) Ledgers shall extend over two consecutive pole spaces and shall overlap the poles at each end by not less than 4 inches. They shall be left in position to brace the poles as the platform is raised with the progress of the work. Ledgers shall be level and shall be securely nailed

of bolted to each pole and shall be placed against the inside face of each pole.

(e) All bearers shall be set with their greater dimension vertical and shall extend beyond the ledgers upon which they rest.

(f) Diagonal bracing shall be provided between the parallel poles, and cross bracing shall be provided between the inner and outer poles or from the outer poles to the ground.

(g) Minimum dimensions and spacing of members shall be in accordance with Table E-1 in WAC 296-304-07011.

(h) Platform planking shall be in accordance with the requirements of (8) of this section.

(i) Backrails and toeboards shall be in accordance with the requirements of (9) of this section.

#### (3) Independent pole metal scaffolds.

(a) Metal scaffold members shall be maintained in good repair and free of corrosion.

(b) All vertical and horizontal members shall be fastened together with a coupler or locking device which will form a positive connection. The locking device shall be of a type which has no loose parts.

(c) Posts shall be kept plumb during erection and the scaffold shall be subsequently kept plumb and rigid by means of adequate bracing.

(d) Posts shall be fitted with bases supported on a firm foundation to distribute the load. When wooden sills are used, the bases shall be fastened thereto.

(e) Bearers shall be located at each set of posts, at each level, and at each intermediate level where working platforms are installed.

(f) Tubular bracing shall be applied both lengthwise and crosswise as required.

(g) Platform planking shall be in accordance with the requirements of (8) of this section.

(h) Backrails and toeboards shall be in accordance with the requirements of (9) of this section.

#### (4) Wood trestle and extension trestle ladders.

(a) The use of trestle ladders, or extension sections or base sections of extension trestle ladders longer than 20 feet is prohibited. The total height of base and extension may, however, be more than 20 feet.

(b) The minimum dimensions of the side rails of the trestle ladder, or the base sections of the extension trestle ladder, shall be as follows:

(i) Ladders up to and including those 16 feet long shall have side rails of not less than 1 5/16 x 2 3/4 inch lumber.

(ii) Ladders over 16 feet long and up to and including those 20 feet long shall have side rails of not less than 1 5/16 x 3 inch lumber.

(c) The side rails of the extension section of the extension trestle ladder shall be parallel and shall have minimum dimensions as follows:

(i) Ladders up to and including 12 feet long shall have side rails of not less than 1 5/16 x 2 1/4 inch lumber.

(ii) Ladders over 12 feet long and up to and including those 16 feet long shall have side rails of not less than 1 5/16 x 2 1/2 inch lumber.

(iii) Ladders over 16 feet long and up to and including those 20 feet long shall have side rails of not less than 1 5/16 x 3 inch lumber. (Rev. 2-17-76)

(d) Trestle ladders and base sections of extension trestle ladders shall be so spread that when in an open position the spread of the trestle at the bottom, inside to inside, shall be not less than 5 1/2 inches per foot of the length of the ladder.

(e) The width between the side rails at the bottom of the trestle ladder or of the base section of the extension trestle ladder shall be not less than 21 inches for all ladders and sections 6 feet or less in length. For longer lengths of ladder the width shall be increased at least 1 inch for each additional foot of length. The width between the side rails of the extension section of the trestle ladder shall be not less than 12 inches.

(f) In order to limit spreading, the top ends of the side rails of both the trestle ladder and of the base section of the extension trestle ladder shall be beveled, or of equivalent construction, and shall be provided with a metal hinge.

(g) A metal spreader or locking device to hold the front and back sections in an open position, and to hold the extension section securely in the elevated position, shall be a component of each trestle ladder or extension trestle ladder.

(h) Rungs shall be parallel and level. On the trestle ladder, or on the base section of the extension trestle ladder, rungs shall be spaced not less than 8 inches nor more than 18 inches apart; on the extension section of the extension trestle ladder, rungs shall be spaced not less than 6 inches nor more than 12 inches apart.

(i) Platform planking shall be in accordance with the requirements of (8) of this section, except that the width of the platform planking shall not exceed the distance between the siderails.

(j) Backrails and toeboards shall be in accordance with the requirements of (9) of this section.

(5) Painters' suspended scaffolds.

(a) The supporting hooks of swinging scaffolds shall be constructed to be equivalent in strength to mild steel or wrought iron, shall be forged with care, shall be not less than 7/8 inch in diameter, and shall be secured to a safe anchorage at all times.

(b) The ropes supporting a swinging scaffold shall be equivalent in strength to first-grade 3/4 inch diameter manila rope properly rigged into a set of standard 6 inch blocks consisting of at least one double and one single block.

(c) Manila and wire ropes shall be carefully examined before each operation and thereafter as frequently as may be necessary to ensure their safe condition.

(d) Each end of the scaffold platform shall be supported by a wrought iron or mild steel stirrup or hanger, which in turn is supported by the suspension ropes.

(e) Stirrups shall be constructed so as to be equivalent in strength to wrought iron 3/4 inch in diameter.

(f) The stirrups shall be formed with a horizontal bottom member to support the platform, shall be provided with means to support the guardrail and midrail

and shall have a loop or eye at the top for securing the supporting hook on the block.

(g) Two or more swinging scaffolds shall not at any time be combined into one by bridging the distance between them with planks or any other form of platform.

(h) No more than two men shall be permitted to work at one time on a swinging scaffold built to the minimum specifications contained in this section. Where heavier construction is used, the number of men permitted to work on the scaffold shall be determined by the size and the safe working load of the scaffold.

(i) Backrails and toeboards shall be in accordance with the requirements of (9) of this section.

(j) The swinging scaffold platform shall be one of the three types described in (k), (l), and (m) of this section.

(k) The ladder-type platform consists of boards upon a horizontal ladder-like structure, referred to herein as the ladder, the side rails of which are parallel. If this type of platform is used the following requirements shall be met:

(i) The width between the side rails shall be no more than 20 inches.

(ii) The side rails of ladders in ladder-type platforms shall be equivalent in strength to a beam of clear straight-grained spruce of the dimensions contained in Table E-2 in WAC 296-304-07013.

(iii) The side rails shall be tied together with tie rods. The tie rods shall be not less than 5/16 inch in diameter, located no more than 5 feet apart, pass through the rails, and be riveted up tight against washers at both ends.

(iv) The rungs shall be of straight-grained oak, ash, or hickory, not less than 1 1/8 inches diameter, with 7/8 inch tenons mortised into the side rails not less than 7/8 inch and shall be spaced no more than 18 inches on centers.

(v) Flooring strips shall be spaced no more than 5/8 inch apart except at the side rails, where 1 inch spacing is permissible.

(vi) Flooring strips shall be cleated on their undersides.

(l) The plank-type platform consists of planks supported on the stirrups or hangers. If this type of platform is used, the following requirements shall be met:

(i) The planks of plank-type platforms shall be not less than 2 x 10 inch lumber.

(ii) The platform shall be no more than 24 inches in width.

(iii) The planks shall be tied together by cleats of not less than 1 x 6 inch lumber, nailed on their undersides at intervals of not more than 4 feet.

(iv) The planks shall extend not less than 6 inches nor more than 18 inches beyond the supporting stirrups.

(v) A cleat shall be nailed across the platform on the underside at each end outside the stirrup to prevent the platform from slipping off the stirrup.

(vi) Stirrup supports shall be not more than 10 feet apart.

(m) The beam-type platform consists of longitudinal side stringers with cross beams set on edge and spaced



not more than 4 feet apart on which longitudinal platform planks are laid. If this type platform is used the following requirements shall be met:

(i) The side stringers shall be of sound, straight-grained lumber, free from knots, and of not less than 2 x 6 inch lumber, set on edge.

(ii) The stringers shall be supported on the stirrups with a clear span between stirrups of not more than 16 feet.

(iii) The stringers shall be bolted to the stirrups by U-bolts passing around the stirrups and bolted through the stringers with nuts drawn up tight on the inside face.

(iv) The ends of the stringers shall extend beyond the stirrups not less than 6 inches nor more than 12 inches at each end of the platform.

(v) The platform shall be supported on cross beams of 2 x 6 inch lumber between the side stringers securely nailed thereto and spaced not more than 4 feet on centers.

(vi) The platform shall be not more than 24 inches wide.

(vii) The platform shall be formed of boards 7/8 inch in thickness by not less than 6 inches in width, nailed tightly together, and extending to the outside face of the stringers.

(viii) The ends of all platform boards shall rest on the top of the cross beams, shall be securely nailed, and at no intermediate points in the length of the platform shall there be any cantilever ends.

(6) Horse scaffolds.

(a) The minimum dimensions of lumber used in the construction of horses shall be in accordance with Table E-3 in WAC 296-304-07011.

(b) Horses constructed of materials other than lumber shall provide the strength, rigidity and security required of horses constructed of lumber.

(c) The lateral spread of the legs shall be equal to not less than one-third of the height of the horse.

(d) All horses shall be kept in good repair, and shall be properly secured when used in staging or in locations where they may be insecure.

(e) Platform planking shall be in accordance with the requirements of (8) of this section.

(f) Backrails and toeboards shall be in accordance with (9) of this section.

(7) Other types of scaffolds.

(a) Scaffolds of a type for which specifications are not contained in this section shall meet the general requirements of (1), (8) and (9) of this section, shall be in accordance with recognized principles of design and shall be constructed in accordance with accepted standards covering such equipment.

(8) Scaffold or platform planking.

(a) Except as otherwise provided in (5)(k) and (m), platform planking shall be of not less than 2 x 10 inch lumber. Platform planking shall be straight-grained and free from large or loose knots and may be either rough or dressed.

(b) Platforms of staging shall be not less than two 10 inch planks in width except in such cases as the structure of the vessel or the width of the trestle ladders make it impossible to provide such a width.

(c) Platform planking shall project beyond the supporting members at either end by at least 6 inches but in no case shall project more than 12 inches unless the planks are fastened to the supporting members.

(d) Table E-4 in WAC 296-304-07011 shall be used as a guide in determining safe loads for scaffold planks.

(9) Backrails and toeboards.

(a) Scaffolding, staging, runways, or working platforms which are supported or suspended more than 5 feet above a solid surface, or at any distance above the water, shall be provided with a railing which has a top rail whose upper surface is from 42 to 45 inches above the upper surface of the staging, platform, or runway and a midrail located halfway between the upper rail and the staging, platform, or runway.

(b) Rails shall be of 2 x 4 inch lumber, flat bar or pipe. When used with rigid supports, taut wire or fiber rope of adequate strength may be used. If the distance between supports is more than 8 feet, rails shall be equivalent in strength to 2 x 4 inch lumber. Rails shall be firmly secured. Where exposed to hot work or chemicals, fiber rope rails shall not be used.

(c) Rails may be omitted where the structure of the vessel prevents their use. When rails are omitted employees working more than 5 feet above solid surfaces shall be protected by safety belts and life lines meeting the requirements of WAC 296-304-09007(2), and employees working over water shall be protected by personal flotation devices meeting the requirements of WAC 296-304-09007(1).

(d) Employees working from swinging scaffolds which are triced out of a vertical line below their supports or from scaffolds on paint floats subject to surging, shall be protected against falling toward the vessel by a railing or a safety belt and line attached to the backrail.

(e) When necessary, to prevent tools and materials from falling on men below, toeboards of not less than 1 x 4 inch lumber shall be provided.

(10) Access to staging.

(a) Access from below to staging more than 5 feet above a floor, deck or the ground shall consist of well secured stairways, cleated ramps, fixed or portable ladders meeting the applicable requirements of WAC 296-304-05003 or rigid type noncollapsible trestles with parallel and level rungs.

(b) Ramps and stairways shall be provided with 36-inch handrails with midrails.

(c) Ladders shall be so located or other means shall be taken so that it is not necessary for employees to step more than one foot from the ladder to any intermediate landing or platform.

(d) Ladders forming integral parts of prefabricated staging are deemed to meet the requirements of these regulations.

(e) Access from above to staging more than 3 feet below the point of access shall consist of a straight, portable ladder meeting the applicable requirements of WAC



296-304-05003 or a Jacob's ladder properly secured, meeting the requirements of WAC 296-304-05007(4).

[Order 76-7, § 296-304-05001, filed 3/1/76; Order 74-25, § 296-304-05001, filed 5/7/74.]

**WAC 296-304-05003 Ladders. (1) General requirements.**

(a) The use of ladders with broken or missing rungs or steps, broken or split side rails, or other faulty or defective construction is prohibited. When ladders with such defects are discovered, they shall be immediately withdrawn from service. Inspection of metal ladders shall include checking for corrosion of interiors of open end, hollow rungs.

(b) When sections of ladders are spliced, the ends shall be abutted, and not fewer than 2 cleats shall be securely nailed or bolted to each rail. The combined cross sectional area of the cleats shall be not less than the cross sectional area of the side rail. The dimensions of side rails for their total length shall be those specified in (2) or (3) of this section.

(c) Portable ladders shall be lashed, blocked or otherwise secured to prevent their being displaced. The side rails of ladders used for access to any level shall extend not less than 36 inches above that level. When this is not practical, grab rails which will provide a secure grip for an employee moving to or from the point of access shall be installed.

(d) Portable metal ladders shall be of strength equivalent to that of wood ladders. Manufactured portable metal ladders provided by the employer shall be in accordance with the provisions of the United States of America Standard Safety Code for Portable Metal Ladders, A14.2.

(e) Portable metal ladders shall not be used near electrical conductors nor for electric arc welding operations.

(f) Manufactured portable wood ladders provided by the employer shall be in accordance with the provisions of the United States of America Standard Safety Code for Portable Wood Ladders, A14.1.

(2) Construction of portable wood cleated ladders up to 30 feet in length.

(a) Wood side rails shall be made from west coast hemlock, eastern spruce, Sitka spruce, or wood of equivalent strength. Material shall be seasoned, straight-grained wood, and free from shakes, checks, decay or other defects which will impair its strength. The use of low density woods is prohibited.

(b) Side rails shall be dressed on all sides, and kept free of splinters.

(c) All knots shall be sound and hard. The use of material containing loose knots is prohibited. Knots shall not appear on the narrow face of the rail and, when in the side face, shall be not more than 1/2 inch in diameter or within 1/2 inch of the edge of the rail or nearer than 3 inches to a tread or rung.

(d) Pitch pockets not exceeding 1/8 inch in width, 2 inches in length and 1/2 inch in depth are permissible in wood side rails, provided that not more than one such pocket appears in each 4 feet of length.

(e) The width between side rails at the base shall be not less than 11 1/2 inches for ladders 10 feet or less in length. For longer ladders this width shall be increased at least 1/4 inch for each additional 2 feet in length.

(f) Side rails shall be at least 1 5/8 x 3 5/8 inches in cross section.

(g) Cleats (meaning rungs rectangular in cross section with the wide dimension parallel to the rails) shall be of the material used for side rails, straight-grained and free from knots. Cleats shall be mortised into the edges of the side rails 1/2 inch, or filler blocks shall be used on the rails between the cleats. The cleats shall be secured to each rail with three 10d common wire nails or fastened with through bolts or other fasteners of equivalent strength. Cleats shall be uniformly spaced not more than 12 inches apart.

(h) Cleats 20 inches or less in length shall be at least 25/32 x 3 inches in cross section. Cleats over 20 inches but not more than 30 inches in length shall be at least 25/32 x 3 3/4 inches in cross section.

(3) Construction of portable wood cleated ladders from 30 to 60 feet in length.

(a) Ladders from 30 to 60 feet in length shall be in accordance with the specifications of (2) of this section with the following exceptions:

(i) Rails shall be of not less than 2 x 6 inch lumber.

(ii) Cleats shall be of not less than 1 x 4 inch lumber.

(iii) Cleats shall be nailed to each rail with five 10d common wire nails or fastened with through bolts or other fastenings of equivalent strength.

[Order 74-25, § 296-304-05003, filed 5/7/74.]

**WAC 296-304-05005 Guarding of deck openings and edges. (1) When employees are working in the vicinity of flush manholes and other small openings of comparable size in the deck and other working surfaces, such openings shall be suitably covered or guarded to a height of not less than 30 inches, except where the use of such guards is made impracticable by the work actually in progress.**

(2) When employees are working around open hatches not protected by coamings to a height of 24 inches or around other large openings, the edge of the opening shall be guarded in the working area to a height of 36 to 42 inches, except where the use of such guards is made impracticable by the work actually in progress.

(3) When employees are exposed to unguarded edges of decks, platforms, flats, and similar flat surfaces, more than 5 feet above a solid surface, the edges shall be guarded by adequate guardrails meeting the requirements of WAC 296-304-05001 (1)(a) and (b), unless the nature of the work in progress or the physical conditions prohibit the use or installation of such guardrails.

(4) When employees are working near the unguarded edges of decks of vessels afloat, they shall be protected by buoyant work vests, meeting the requirements of WAC 296-304-09007(1).

(5) Sections of bilges from which floor plates or gratings have been removed shall be guarded by guardrails except where they would interfere with work in progress. If these open sections are in a walkway at least two 10-

inch planks placed side by side, or equivalent, shall be laid across the opening to provide a safe walking surface.

(6) Gratings, walkways, and catwalks, from which sections or ladders have been removed, shall be barricaded with adequate guardrails.

[Order 74-25, § 296-304-05005, filed 5/7/74.]

**WAC 296-304-05007 Access to vessels.** (1) Access to vessels afloat. The employer shall not permit employees to board or leave any vessel, except a barge or river towboat, until the following requirements have been met:

(a) Whenever practicable, a gangway of not less than 20 inches walking surface, of adequate strength, maintained in safe repair and safely secured shall be used. If a gangway is not practicable, a substantial straight ladder, extending at least 36 inches above the upper landing surface and adequately secured against shifting or slipping shall be provided. When conditions are such that neither a gangway nor a straight ladder can be used, a Jacob's ladder meeting the requirements of (4)(a) and (b) of this section may be used.

(b) Each side of such gangway, and the turn table if used, shall have a railing with a minimum height of approximately 33 inches measured perpendicularly from rail to walking surface at the stanchion, with a mid rail. Rails shall be of wood, pipe, chain, wire or rope and shall be kept taut at all times.

(c) Gangways on vessels inspected and certificated by the U.S. Coast Guard are deemed to meet the foregoing requirements, except in cases where the vessel's regular gangway is not being used.

(d) The gangway shall be kept properly trimmed at all times.

(e) When a fixed tread accommodation ladder is used, and the angle is low enough to require employees to walk on the edge of the treads, cleated duckboards shall be laid over and secured to the ladder.

(f) When the lower end of a gangway overhangs the water between the ship and the dock in such a manner that there is danger of employees falling between the ship and the dock, a net or other suitable protection shall be rigged at the foot of the gangway in such a manner as to prevent employees from falling from the end of the gangway.

(g) If the foot of the gangway is more than one foot away from the edge of the apron, the space between them shall be bridged by a firm walkway equipped with railings, with a minimum height of approximately 33 inches with mid rails on both sides.

(h) Supporting bridles shall be kept clear so as to permit unobstructed passage for employees using the gangway.

(i) When the upper end of the means of access rests on or flush with the top of the bulwark, substantial steps properly secured and equipped with at least one substantial handrail approximately 33 inches in height shall be provided between the top of the bulwark and the deck.

(j) Obstructions shall not be laid on or across the gangway.

(k) The means of access shall be adequately illuminated for its full length.

(1) Unless the construction of the vessel makes it impossible, the means of access shall be so located that drafts of cargo do not pass over it. In any event loads shall not be passed over the means of access while employees are on it.

(2) Access to vessels in drydock or between vessels. Gangways meeting the requirements of (1)(a), (b), (i), (j) and (l) of this section shall be provided for access from wing wall to vessel or, when two or more vessels, other than barges or river towboats, are lying abreast, from one vessel to another.

(3) Access to barges and river towboats.

(a) Ramps for access of vehicles to or between barges shall be of adequate strength, provided with side boards, well maintained and properly secured.

(b) Unless employees can step safely to or from the wharf, float, barge, or river towboat, either a ramp in accordance with the requirements of (a) of this section or a safe walkway in accordance with the requirements of (1)(g) of this section shall be provided. When a walkway is impracticable, a substantial straight ladder, extending at least 36 inches above the upper landing surface and adequately secured against shifting or slipping shall be provided. When conditions are such that neither a walkway nor a straight ladder can be used, a Jacob's ladder in accordance with the requirements of (4) of this section may be used.

(c) The means of access shall be in accordance with the requirements of (1)(i), (j) and (k) of this section.

(4) Jacob's ladders. (a) Jacob's ladders shall be of the double rung or flat tread type. They shall be well maintained and properly secured.

(b) A Jacob's ladder shall either hang without slack from its lashings or be pulled up entirely.

[Order 74-25, § 296-304-05007, filed 5/7/74.]

**WAC 296-304-05009 Access to and guarding of dry docks and marine railings.** (1) A gangway, ramp or permanent stairway of not less than 20 inches walking surface, of adequate strength, maintained in safe repair and securely fastened, shall be provided between a floating dry dock and the pier or bulkhead.

(2) Each side of such gangway, ramp or permanent stairway, including those which are used for access to wing walls from dry dock floors, shall have a railing with a mid rail. Such railings on gangways or ramps shall be approximately 42 inches in height; and railings on permanent stairways shall be not less than approximately 30 or more than approximately 34 inches in height. Rails shall be of wood, pipe, chain, wire, or rope and shall be kept taut at all times.

(3) Railings meeting the requirements of (2) of this section shall be provided on the means of access to and from the floors of graving docks.

(4) Railings approximately 42 inches in height, with a mid rail, shall be provided on the edges of wing walls of floating dry docks and on the edges of graving docks. Sections of the railings may be temporarily removed

where necessary to permit line handling while a vessel is entering or leaving the dock.

(5) When employees are working on the floor of a floating dry dock where they are exposed to the hazard of falling into the water, the end of the dry dock shall be equipped with portable stanchions and 42 inch railings with a mid rail. When such a railing would be impracticable or ineffective, other effective means shall be provided to prevent men from falling into the water.

(6) Access to wingwalls from floors of dry docks shall be by ramps, permanent stairways or ladders meeting the applicable requirements of WAC 296-304-05003.

(7) Catwalks on stiles of marine railways shall be no less than 20 inches wide and shall have on at least one side a guardrail and midrail meeting the requirements of WAC 296-304-05001 (9)(a) and (b).

[Order 74-25, § 296-304-05009, filed 5/7/74.]

**WAC 296-304-05011 Access to cargo spaces and confined spaces.** (1) Cargo spaces.

(a) There shall be at least one safe and accessible ladder in any cargo space which employees must enter.

(b) When any fixed ladder is visibly unsafe, the employer shall prohibit its use by employees.

(c) Straight ladders of adequate strength and suitably secured against shifting or slipping shall be provided as necessary when fixed ladders in cargo spaces do not meet the requirements of (a) of this section. When conditions are such that a straight ladder cannot be used, a Jacob's ladder meeting the requirements of WAC 296-304-05007(4) may be used.

(d) When cargo is stowed within 4 inches of the back of ladder rungs, the ladder shall be deemed "unsafe" for the purpose of this section.

(e) Fixed ladders or straight ladders provided for access to cargo spaces shall not be used at the same time that cargo drafts or other loads are entering or leaving the hold. Before using these ladders to enter or leave the hold, the employee shall be required to inform the winchman or crane signalman of his intention.

(2) Confined spaces.

(a) More than one means of access shall be provided to a confined space in which employees are working and in which the work may generate a hazardous atmosphere in the space except where the structure or arrangement of the vessel makes this provision impractical.

(b) When the ventilation ducts required by these regulations must pass through these means of access, the ducts shall be of such a type and so arranged as to permit free passage of an employee through at least two of these means of access.

[Order 74-25, § 296-304-05011, filed 5/7/74.]

**WAC 296-304-05013 Working surfaces.** (1) When firebox floors present tripping hazards of exposed tubing or of missing or removed refractory, sufficient planking to afford safe footing shall be laid while work is being carried on within the boiler.

[Title 296 WAC—p 2154]

(2) When employees are working aloft, or elsewhere at elevations more than 5 feet above a solid surface, either scaffolds or a sloping ladder, meeting the requirements of this section, shall be used to afford safe footing, or the employees shall be protected by safety belts and lifelines meeting the requirements of WAC 296-304-09007(2). Employees visually restricted by blasting hoods, welding helmets, and burning goggles shall work from scaffolds, not from ladders, except for the initial and final welding or burning operation to start or complete a job such as the erection and dismantling of hung scaffolding, or other similar, nonrepetitive jobs of brief duration.

(3) For work performed in restricted quarters, such as behind boilers and in between congested machinery units and piping, work platforms at least 20 inches wide meeting the requirements of WAC 296-304-05001 (8)(b) shall be used. Backrails may be omitted if bulk-heading, boilers, machinery units, or piping afford proper protection against falling.

(4) When employees are boarding, leaving, or working from small boats or floats, they shall be protected by personal flotation devices meeting the requirements of WAC 296-304-09007(1).

[Order 76-7, § 296-304-05013, filed 3/1/76; Order 74-25, § 296-304-05013, filed 5/7/74.]

**WAC 296-304-060 General working conditions—Scope and application.** All sections of this chapter which include WAC 296-304-060 in the section number apply to general working conditions.

[Order 74-25, § 296-304-060, filed 5/7/74.]

**WAC 296-304-06001 Housekeeping.** (1) Good housekeeping conditions shall be maintained at all times. Adequate aisles and passageways shall be maintained in all work areas. All staging platforms, ramps, stairways, walkways, aisles, and passageways on vessels or dry docks shall be kept clear of all tools, materials, and equipment except that which is in use, and all debris such as welding rod tips, bolts, nuts, and similar material. Hose and electric conductors shall be elevated over or placed under the walkway or working surfaces or covered by adequate crossover planks.

(2) All working areas on vessels and dry docks shall be kept reasonably free of debris, and construction material shall be so piled as not to present a hazard to employees.

(3) Slippery conditions on walkways or working surfaces shall be eliminated as they occur.

(4) Free access shall be maintained at all times to all exits and to all fire-alarm boxes or fire-extinguishing equipment.

(5) All oils, paints, thinners, solvents waste, rags, or other flammable substances shall be kept in fire resistant covered containers when not in use.

[Order 74-25, § 296-304-06001, filed 5/7/74.]

**WAC 296-304-06003 Illumination.** (1) All means of access and walkways leading to working areas as well

as the working areas themselves shall be adequately illuminated.

(2) Temporary lights shall meet the following requirements:

(a) Temporary lights shall be equipped with guards to prevent accidental contact with the bulb, except that guards are not required when the construction of the reflector is such that the bulb is deeply recessed.

(b) Temporary lights shall be equipped with heavy duty electric cords with connections and insulation maintained in safe condition. Temporary lights shall not be suspended by their electric cords unless cords and lights are designed for this means of suspension. Splices which have insulation equal to that of the cable are permitted.

(c) Cords shall be kept clear of working spaces and walkways or other locations in which they are readily exposed to damage.

(3) Exposed noncurrent-carrying metal parts of temporary lights furnished by the employer shall be grounded either through a third wire in the cable containing the circuit conductors or through a separate wire which is grounded at the source of the current. Grounding shall be in accordance with the requirements of WAC 296-304-08003(2).

(4) Where temporary lighting from sources outside the vessel is the only means of illumination, portable emergency lighting equipment shall be available to provide illumination for safe movement of employees.

(5) Employees shall not be permitted to enter dark spaces without a suitable portable light. The use of matches and open flame lights is prohibited. In nongas free spaces, portable lights shall meet the requirements of WAC 296-304-02005(2).

(6) Temporary lighting stringers or streamers shall be so arranged as to avoid overloading of branch circuits. Each branch circuit shall be equipped with overcurrent protection of capacity not exceeding the rated current carrying capacity of the cord used.

[Order 74-25, § 296-304-06003, filed 5/7/74.]

**WAC 296-304-06005 Utilities.** (1) Steam supply and hoses.

(a) Prior to supplying a vessel with steam from a source outside the vessel, the employer shall ascertain from responsible vessel's representatives, having knowledge of the condition of the plant, the safe working pressure of the vessel's steam system. The employer shall install a pressure gauge and a relief valve of proper size and capacity at the point where the temporary steam hose joins the vessel's steam piping system or systems. The relief valve shall be set and capable of relieving at a pressure not exceeding the safe working pressure of the vessel's system in its present condition, and there shall be no means of isolating the relief valve from the system which it protects. The pressure gauge and relief valve shall be located so as to be visible and readily accessible.

(b) Steam hose and fittings shall have a safety factor of not less than five.

(c) When steam hose is hung in a bight or bights, the weight shall be relieved by appropriate lines. The hose shall be protected against chafing.

(d) Steam hose shall be protected from damage and hose and temporary piping shall be so shielded where passing through normal work areas as to prevent accidental contact by employees.

(2) Electric power.

(a) When the vessel is supplied with electric power from a source outside the vessel, the following precautions shall be taken prior to energizing the vessel's circuits:

(i) If in dry dock, the vessel shall be adequately grounded.

(ii) The employer shall ascertain from responsible vessel's representatives, having a knowledge of the condition of the vessel's electrical system, that all circuits to be energized are in a safe condition.

(iii) All circuits to be energized shall be equipped with overcurrent protection of capacity not exceeding the rated current carrying capacity of the cord used.

(3) Infrared electrical heat lamps.

(a) All infrared electrical heat lamps shall be equipped with guards that surround the lamps with the exception of the face, to minimize accidental contact with the lamps.

[Order 74-25, § 296-304-06005, filed 5/7/74.]

**WAC 296-304-06007 Work in confined or isolated spaces.** When any work is performed in a confined space, except as provided in WAC 296-304-04001 (2)(c), or when an employee is working alone in an isolated location, frequent checks shall be made to ensure the safety of the employees.

[Order 74-25, § 296-304-06007, filed 5/7/74.]

**WAC 296-304-06009 Work on or in the vicinity of radar and radio.** (1) No employees other than radar or radio repairmen shall be permitted to work on masts, king posts or other aloft areas unless the radar and radio are secured or otherwise made incapable of radiation. In either event, the radio and radar shall be appropriately tagged.

(2) Testing of radar or radio shall not be done until the employer can schedule such tests at a time when no work is in progress aloft or personnel can be cleared from the danger area according to minimum safe distances established for and based on the type, model, and power of the equipment.

[Order 74-25, § 296-304-06009, filed 5/7/74.]

**WAC 296-304-06011 Work in or on lifeboats.** (1) Before employees are permitted to work in or on a lifeboat, either stowed or in a suspended position, the employer shall ensure that the boat is secured independently of the releasing gear to prevent the boat from falling due to accidental tripping of the releasing gear and movement of the davits or capsizing of a boat in chocks.

(2) Employees shall not be permitted to remain in boats while the boats are being hoisted into final stowed position.

(3) Employees shall not be permitted to work on the outboard side of lifeboats stowed on their chocks unless the boats are secured by gripes or otherwise secured to prevent them from swinging outboard.

[Order 74-25, § 296-304-06011, filed 5/7/74.]

**WAC 296-304-06013 Health and sanitation.** (1) No chemical product, such as a solvent or preservative; no structural material, such as cadmium or zinc coated steel, or plastic material; and no process material, such as welding filler metal; which is a hazardous material within the meaning of WAC 296-304-01001(19), shall be used until the employer has ascertained the potential fire, toxic, or reactivity hazards which are likely to be encountered in the handling, application, or utilization of such a material.

(2) In order to ascertain the hazards, as required by subsection (1) of this section, the employer shall obtain the following items of information which are applicable to a specific product or material to be used:

(a) The name, address, and telephone number of the source of the information specified in this section preferably those of the manufacturer of the product or material.

(b) The trade name and synonyms for a mixture of chemicals, a basic structural material, or for a process material; and the chemical name and synonyms, chemical family, and formula for a single chemical.

(c) Chemical names of hazardous ingredients, including, but not limited to, those in mixtures, such as those in: (i) Paints, preservatives, and solvents; (ii) alloys, metallic coatings, filler metals and their coatings or core fluxes; and (iii) other liquids, solids, or gases (e.g., abrasive materials).

(d) An indication of the percentage, by weight or volume, which each ingredient of a mixture bears to the whole mixture, and of the threshold limit value of each ingredient, in appropriate units.

(e) Physical data about a single chemical or a mixture of chemicals, including boiling point, in degrees Fahrenheit; vapor pressure, in millimeters of mercury; vapor density of gas or vapor (air=1); solubility in water, in percent by weight; specific gravity of material (water=1); percentage volatile, by volume, at 70°F.; evaporation rate for liquids (either butyl acetate or ether may be taken as 1); and appearance and odor.

(f) Fire and explosion hazard data about a single chemical or a mixture of chemicals, including flashpoint, in degrees Fahrenheit; flammable limits, in percent by volume in air; suitable extinguishing media or agents; special fire fighting procedures; and unusual fire and explosion hazard information.

(g) Health hazard data, including threshold limit value, in appropriate units, for a single hazardous chemical or for the individual hazardous ingredients of a mixture as appropriate, effects of overexposure; and emergency and first aid procedures.

(h) Reactivity data, including stability, incompatibility, hazardous decomposition products, and hazardous polymerization.

(i) Procedures to be followed and precautions to be taken in cleaning up and disposing of materials leaked or spilled.

(j) Special protection information, including use of personal protective equipment, such as respirators, eye protection, and protective clothing, and of ventilation, such as local exhaust, general, special, or other types.

(k) Special precautionary information about handling and storing.

(l) Any other general precautionary information.

(3) The pertinent information required by subsection (2) of this section shall be recorded either on United States Department of Labor Form LSB 00S-4, Material Safety Data Sheet, or on an essentially similar form which has been approved by the department of labor and industries. Copies of Form LSB 00S-4 may be obtained at any of the following regional offices of the occupational safety and health administration:

(a) Pacific region. (Arizona, California, Hawaii, and Nevada.)

10353 Federal Building, 450 Golden Gate Avenue, Box 36017, San Francisco, Calif. 94102.

(b) Region X, OSHA, (Alaska, Washington, Idaho, and Oregon), Federal Office Building, 909 First Avenue, Seattle, Washington 98174.

A completed MSDS form shall be preserved and available for inspection for each hazardous chemical on the worksite.

(4) The employer shall instruct employees who will be exposed to the hazardous materials as to the nature of the hazards and the means of avoiding them.

(5) The employer shall provide all necessary controls, and the employees shall be protected by suitable personal protective equipment against the hazards identified under subsection (1) of this section and those hazards for which specific precautions are required in WAC 296-304-020 through 296-304-04013.

(6) The employer shall provide adequate washing facilities for employees engaged in the application of paints or coatings or in other operations where contaminants can, by ingestion or absorption, be detrimental to the health of the employees. The employer shall encourage good personal hygiene practices by informing the employees of the need for removing surface contaminants by thorough washing of hands and face prior to eating or smoking.

(7) The employer shall not permit eating or smoking in areas undergoing surface preparation or preservation or where shiprepairing, shipbuilding, or shipbreaking operations produce atmospheric contamination.

(8) The employer shall not permit employees to work in the immediate vicinity of uncovered garbage and shall ensure that employees working beneath or on the outboard side of a vessel are not subject to contamination by drainage or waste from overboard discharges.

(9) Requirements of WAC 296-62-054 et seq., will apply to shiprepairing, shipbuilding, and shipbreaking when potential hazards of chemicals and communicating

information concerning hazards and appropriate protective equipment is applicable to an operation.

[Statutory Authority: Chapter 49.17 RCW, 88-14-108 (Order 88-11), § 296-304-06013, filed 7/6/88; Order 76-7, § 296-304-06013, filed 3/1/76; Order 74-25, § 296-304-06013, filed 5/7/74.]

**WAC 296-304-06015 First aid.** (1) Unless a first-aid room and a qualified attendant are close at hand and prepared to render first aid to employees on behalf of the employer, the employer shall furnish a first-aid kit for each vessel on which work is being performed, except that when work is being performed on more than one small vessel at one pier, only one kit shall be required. The kit, when required, shall be kept close to the vessel and at least one employee, close, at hand, shall be qualified to administer first aid to the injured.

(2) The first-aid kit shall consist of a weatherproof container with individual sealed packages for each type of item. The contents of such kit shall contain a sufficient quantity of at least the following types of items:

Gauze roller bandages, 1 inch and 2 inch.

Gauze compress bandages, 4 inch.

Adhesive bandages, 1 inch.

Triangular bandage, 40 inch.

Ammonia inhalants and ampules.

Antiseptic applicators or swabs.

Burn dressing.

Eye dressing.

Wire or thin board splints.

Forceps and tourniquet.

(3) The contents of the first-aid kit shall be checked before being sent out on each job and at least weekly on each job to ensure that the expended items are replaced.

(4) There shall be available for each vessel on which ten or more employees are working one Stokes basket stretcher, or equivalent, permanently equipped with bridles for attaching to the hoisting gear, except that no more than two stretchers are required on each job location. A blanket or other liner suitable for transferring the patient to and from the stretcher shall be provided. Stretchers shall be kept close to the vessels. This section does not apply where ambulance services which are available are known to carry such stretchers.

[Order 74-25, § 296-304-06015, filed 5/7/74.]

**WAC 296-304-070 Gear and equipment for rigging and materials handling—Scope and application.** All sections of this chapter which include WAC 296-304-070 in the section number apply to gear and equipment for rigging and materials handling.

[Order 74-25, § 296-304-070, filed 5/7/74.]

**WAC 296-304-07001 Inspection.** (1) All gear and equipment provided by the employer for rigging and materials handling shall be inspected before each shift and, when necessary, at intervals during its use to ensure that is safe. Defective gear shall be removed and repaired or replaced before further use.

(2) The safe working load of gear as specified in WAC 296-304-07003 and 296-304-07005 shall not be exceeded.

[Order 74-25, § 296-304-07001, filed 5/7/74.]

**WAC 296-304-07003 Ropes, chains and slings.** (1) Manila rope and manila rope slings.

(a) Table G-1 in WAC 296-304-07011 shall be used to determine the safe working load of various sizes of manila rope and manila rope slings at various angles, except that higher safe working loads are permissible when recommended by the manufacturer for specific, identifiable products: *Provided*, That a safety factor of not less than five is maintained.

(2) Wire rope and wire rope slings.

(a) Tables G-2 through G-5 in WAC 296-304-07011 shall be used to determine the safe working loads of various sizes and classifications of improved plow steel wire rope and wire rope slings with various types of terminals. For sizes, classifications and grades not included in these tables, the safe working load recommended by the manufacturer for specific, identifiable products shall be followed: *Provided*, That a safety factor of not less than five is maintained.

(b) Protruding ends of strands in splices on slings and bridles shall be covered or blunted.

(c) Where U-bolt wire rope clips are used to form eyes, Table G-6 in WAC 296-304-07011 shall be used to determine the number and spacing of clips. The U-bolt shall be applied so that the "U" section is in contact with the dead end of the rope.

(d) Wire rope shall not be secured by knots.

(3) Chains and chain slings.

(a) Tables G-7 and G-8 in WAC 296-304-07011 shall be used to determine the working load limit of various sizes of wrought iron and alloy steel chains and chain slings, except that higher safe working loads are permissible when recommended by the manufacturer for specific, identifiable products.

(b) All sling chains, including end fastenings, shall be given a visual inspection before being used on the job. A thorough inspection of all chains in use shall be made every 3 months. Each chain shall bear an indication of the month in which it was thoroughly inspected. The thorough inspection shall include inspection for wear, defective welds, deformation and increase in length or stretch.

(c) Interlink wear, not accompanied by stretch in excess of 5 percent, shall be noted and the chain removed from service when maximum allowable wear at any point of link, as indicated in Table G-9 in WAC 296-304-07011 has been reached.

(d) Chain slings shall be removed from service when, due to stretch, the increase in length of a measured section exceeds five percent; when a link is bent, twisted or otherwise damaged; or when raised scarfs or defective welds appear.

(e) All repairs to chains shall be made under qualified supervision. Links or portions of the chain found to be defective as described in (d) of this section shall be replaced by links having proper dimensions and made of



material similar to that of the chain. Before repaired chains are returned to service, they shall be proof tested to the proof test load recommended by the manufacturer.

(f) Wrought iron chains in constant use shall be annealed or normalized at intervals not exceeding six months when recommended by the manufacturer. The chain manufacturer shall be consulted for recommended procedures for annealing or normalizing. Alloy chains shall never be annealed.

(g) A load shall not be lifted with a chain having a kink or knot in it. A chain shall not be shortened by bolting, wiring or knotting.

[Order 76-7, § 296-304-07003, filed 3/1/76; Order 74-25, § 296-304-07003, filed 5/7/74.]

**WAC 296-304-07005 Shackles and hooks. (1) Shackles.**

(a) Table G-10 in WAC 296-304-07011 shall be used to determine the safe working loads of various sizes of shackles, except that higher safe working loads are permissible when recommended by the manufacturer for specific, identifiable products: *Provided*, That a safety factor of not less than five is maintained.

**(2) Hooks.**

(a) The manufacturer's recommendations shall be followed in determining the safe working loads of the various sizes and types of specific and identifiable hooks. All hooks for which no applicable manufacturer's recommendations are available shall be tested to twice the intended safe working load before they are initially put into use. The employer shall maintain a record of the dates and results of such tests.

(b) Loads shall be applied to the throat of the hook since loading the point overstresses and bends or springs the hook.

(c) Hooks shall be inspected periodically to see that they have not been bent by overloading. Bent or sprung hooks shall not be used.

[Order 76-7, § 296-304-07005, filed 3/1/76; Order 74-25, § 296-304-07005, filed 5/7/74.]

**WAC 296-304-07007 Chain falls and pull-lifts. (1) Chain falls and pull-lifts shall be clearly marked to show the capacity and the capacity shall not be exceeded.**

(2) Chain falls shall be regularly inspected to ensure that they are safe, particular attention being given to the lift chain, pinion, sheaves and hooks for distortion and wear. Pull-lifts shall be regularly inspected to ensure that they are safe, particular attention being given to the ratchet, pawl, chain and hooks for distortion and wear.

(3) Straps, shackles, and the beam or overhead structure to which a chain fall or pull-lift is secured shall be of adequate strength to support the weight of load plus gear. The upper hook shall be moused or otherwise secured against coming free of its support.

(4) Scaffolding shall not be used as a point of attachment for lifting devices, such as tackles, chain falls, and pull-lifts unless the scaffolding is specifically designed for that purpose.

[Title 296 WAC—p 2158]

[Order 74-25, § 296-304-07007, filed 5/7/74.]

**WAC 296-304-07009 Hoisting and hauling equipment. (1) Derrick and crane certification:**

(a) Derricks and cranes which are part of, or regularly placed aboard barges, other vessels, or on wingwalls of floating drydocks, and are used to transfer materials or equipment from or to a vessel or drydock, shall be tested and certificated in accordance with the standards provided in WAC 296-304-130 gear certification, by persons accredited for that purpose.

(b)(a) of this section shall take effect 180 days after the effective date of the amendment.

(2) The moving parts of hoisting and hauling equipment shall be guarded.

(3) Mobile crawler or truck cranes used on a vessel:

(a) The maximum manufacturer's rated safe working loads for the various working radii of the boom and the maximum and minimum radii at which the boom may be safely used with and without outriggers shall be conspicuously posted near the controls and shall be visible to the operator. A radius indicator shall be provided.

(b) The posted safe working loads of mobile crawler or truck cranes under the conditions of use shall not be exceeded.

(4) Accessible areas within the swing radius of the outermost part of the body of a revolving derrick or crane either permanently or temporarily mounted, shall be guarded in such a manner as to prevent an employee from being in such a position as to be struck by the crane or caught between the crane and fixed parts of the vessel or of the crane itself.

(5) Marine railways:

(a) The cradle or carriage on the marine railway shall be positively blocked or secured when in the hauled position to prevent it from being accidentally released.

[Order 74-25, § 296-304-07009, filed 5/7/74.]

**WAC 296-304-07011 Use of gear. (1) Loads shall be safely rigged before being hoisted.**

(2) Plates shall be handled on and off hulls by means of shackles whenever possible. Clips or pads of ample size shall be welded to the plate to receive the shackle pins whenever there are no holes in the plate. When it is not possible to make holes in or to weld pads to the plate, alligator tongs, grab hooks, grab clamps or screw clamps may be used. In such cases special precautions shall be taken to keep employees from under such lifts.

(3) Tag lines shall be provided on loads likely to swing or to need guidance.

(4) When slings are secured to eyebolts, the slings shall be so arranged, using spreaders if necessary, that the pull is within 20 degrees of the axis of the bolt.

(5) Slings shall be padded by means of wood blocks or other suitable material where they pass over sharp edges or corners of loads so as to prevent cutting or kinking.

(6) Skips shall be rigged to be handled by not less than 3 legged bridles, and all legs shall always be used. When open end skips are used, means shall be taken to prevent the contents from falling.



(7) Loose ends of idle legs of slings in use shall be hung on the hook.

(8) Employees shall not be permitted to ride the hook or the load.

(9) Loads (tools, equipment or other materials) shall not be swung or suspended over the heads of employees.

(10) Pieces of equipment or structure susceptible to falling or dislodgement shall be secured or removed as early as possible.

(11) An individual who is familiar with the signal code in use shall be assigned to act as a signalman when the hoist operator cannot see the load being handled. Communications shall be made by means of clear and distinct visual or auditory signals except that verbal signals shall not be permitted.

(12) Pallets, when used, shall be of such material and construction and so maintained as to safely support and carry the loads being handled on them.

(13) A section of hatch through which materials or equipment are being raised, lowered, moved, or otherwise shifted manually or by a crane, winch, hoist, or derrick, shall be completely opened. The beam or pontoon left in place adjacent to an opening shall be sufficiently lashed, locked or otherwise secured to prevent it from being unshipped so that it cannot be displaced by accident.

(14) Hatches shall not be opened or closed while employees are in the square of the hatch below.

(15) Before loads or empty lifting gear are raised, lowered, or swung, clear and sufficient advance warning shall be given to employees in the vicinity of such operations.

(16) At no time shall an employee be permitted to place himself in hazardous position between a swinging load and a fixed object.

[Order 74-25, § 296-304-07011, filed 5/7/74.]

**WAC 296-304-07013 Qualifications of operators.**

(1) When ship's gear is used to hoist materials aboard, a competent person shall determine that the gear is properly rigged, that it is in safe condition, and that it will not be overloaded by the size and weight of the lift.

(2) Only those employees who understand the signs, notices, and operating instructions, and are familiar with the signal code in use, shall be permitted to operate a crane, winch, or other power operated hoisting apparatus.

(3) No employee known to have defective uncorrected eyesight or hearing, or to be suffering from heart disease, epilepsy, or similar ailments which may suddenly incapacitate him, shall be permitted to operate a crane, winch or other power operated hoisting apparatus.

(4) No minor under eighteen years of age shall be employed in occupations involving the operation of any power-driven hoisting apparatus or assisting in such operations by work such as hooking on, loading slings, rigging gear, etc.

(1989 Ed.)

TABLE E-1

DIMENSIONS AND SPACING OF WOOD INDEPENDENT-POLE SCAFFOLD MEMBERS

Structural Members	Light duty (Up to 25 pounds per square foot)			Heavy duty (25 to 75 pounds per square foot)		
	Height in feet			Height in feet		
	24 or less	24-40	40-60	24 or less	24-40	40-60
Poles or uprights (in inches) —————	2x4	3x4	4x4	3x4	4x4	4x6
		or 2x6				
Bearers (in inches) ———	2x4	2x6	2x6	2x8	2x8	2x10
Ledgers (in inches) ———	2x6	2x6	2x6	2x8	2x8	2x8
Stringer (not supporting bearers) (in inches) —————	1x6	1x6	1x6	1x6	1x6	1x6
Braces (in inches) ———	1x4	1x6	1x6	1x6	1x6	1x6
Pole spacing—longitudinally (in feet) —	7 1/2	7 1/2	7 1/2	7	7	7
Pole spacing—transversely (in feet) ———	6 1/2 min	7 1/2 min	8 1/2 min	6 1/2	10	10
Ledger spacing—vertically (in feet) ———	7	7	7	4 1/2	4 1/2	4 1/2

TABLE E-2

SPECIFICATIONS FOR SIDE RAILS OF LADDERS

Length (in feet)	Cross section (in inches)	
	At ends	At center
15 —————	1 7/8 x 2 3/4	1 7/8 x 3 3/4
16 —————	1 7/8 x 2 3/4	1 7/8 x 3 3/4
17 —————	1 7/8 x 3	1 7/8 x 4
18 —————	1 7/8 x 3	1 7/8 x 4
20 —————	1 7/8 x 3	1 7/8 x 4 1/2
24 —————	1 7/8 x 3	1 7/8 x 4 1/2

TABLE E-3

SPECIFICATIONS FOR THE CONSTRUCTION OF HORSES

Structural Members	Height in feet		
	Up to 10	10 to 16	16 to 20
	Inches	Inches	Inches
Legs —————	2x4	3x4	4x6
Bearers or headers ———	2x6	2x8	4x6
Crossbraces —————	2x4	2x4	2x6
	or		
	1x8		
Longitudinal braces ———	2x4	2x6	2x6

[Title 296 WAC—p 2159]

TABLE E-4

SAFE CENTER LOADS FOR SCAFFOLD PLANK OF 1,100 POUNDS FIBRE STRESS

[Codification note: The graphic presentation of this table has been varied in order that it would fall within the printing specifications for the Washington Administrative Code. The following table had lumber dimensions in the table heading typed in vertically across the page while the remainder of the table was typed horizontally on the page. The "Span in Feet" materials (6 through 16) which ran top to bottom has been switched to run left to right on the page. The "Lumber dimensions in inches" which ran left to right on the page has been switched to run top to bottom on the page.]

Lumber dimensions in inches	Span in Feet					
	6	8	10	12	14	16
A-2 x 10						
B-1 5/8 x 9 1/2	256	192	153	128	110	—
A-2 x 12						
B-1 5/8 x 11 1/2	309	232	186	155	133	116
A-3 x 8						
B-2 5/8 x 7 1/2	526	395	316	263	225	197
A-3 x 10						
B-2 5/8 x 9 1/2	667	600	400	333	286	250
A-3 x 12						
B-2 5/8 x 11 1/2	807	605	484	404	346	303

(A)—Rough lumber.  
(B)—Dressed lumber.

TABLE G-1

MANILA ROPE (in pounds or tons of 2000 pounds)

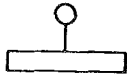



Cir-cum-fer-ence	Dia-meter in Inches	Single Leg	60°	45°	30°
					
3/4	1/4	120 lbs.	204 lbs.	170 lbs.	120 lbs.
1	5/16	200	346	282	200
1-1/8	3/8	270	467	380	270
1-1/4	7/16	350	605	493	350
1-3/8	15/32	450	775	635	450
1-1/2	1/2	530	915	798	530
1-3/4	9/16	690	1190	973	690
2	5/8	880	1520	1240	880
2-1/4	3/4	1080	1870	1520	1080
2-1/2	13/16	1300	2250	1830	1300
2-3/4	7/8	1540	2660	2170	1540
3	1	1800	3120	2540	1800
3-1/4	1-1/16	1.0 tons	1.7 tons	1.4 tons	1.0 tons
3-1/2	1-1/8	1.2	2.1	1.7	1.2
3-3/4	1-1/4	1.35	2.3	1.9	1.35
4	1-5/16	1.5	2.6	2.1	1.5
4-1/2	1-1/2	1.8	3.1	2.5	1.8
5	1-5/8	2.25	3.9	3.2	2.25
5-1/2	1-3/4	2.6	4.5	3.7	2.6
6	2	3.1	5.4	4.4	3.1
6-1/2	2-1/8	3.6	6.2	5.1	3.6

TABLE G-2

RATED CAPACITIES FOR IMPROVED PLOW STEEL, INDEPENDENT WIRE ROPE CORE, WIRE ROPE AND WIRE ROPE SLINGS (in tons of 2000 pounds)

Rope Dia. Inches	SINGLE LEG					
	Vertical			Choker		
	A	B	C	A	B	C
6X19 CLASSIFICATION						
1/4"	.59	.56	.53	.44	.42	.40
3/8"	1.3	1.2	1.1	.98	.93	.86
1/2"	2.3	2.2	2.0	1.7	1.6	1.5
5/8"	3.6	3.4	3.0	2.7	2.5	2.2
3/4"	5.1	4.9	4.2	3.8	3.6	3.1
7/8"	6.9	6.6	5.5	5.2	4.9	4.1
1"	9.0	8.5	7.2	6.7	6.4	5.4
1-1/8"	11.	10.	9.0	8.5	7.8	6.8
6X37 CLASSIFICATION						
1-1/4"	13.	12.	10.	9.9	9.2	7.9
1-3/8"	16.	15.	13.	12.	11.	9.6
1-1/2"	19.	17.	15.	14.	13.	11.
1-3/4"	26.	24.	20.	19.	18.	15.
2"	33.	30.	26.	25.	23.	20.
2-1/4"	41.	38.	33.	31.	29.	25.


(A) - Socket or swaged terminal attachment.  
(B) - Mechanical sleeve attachment.  
(C) - Hand tucked splice attachment.

TABLE G-3

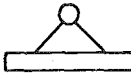
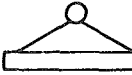
RATED CAPACITIES FOR IMPROVED PLOW STEEL, INDEPENDENT WIRE ROPE CORE, WIRE ROPE SLINGS (in tons of 2000 pounds)

[Codification note: The graphic presentation of this table has been varied slightly in order that it would fall within the printing specifications for the Washington Administrative Code. The following table was too wide to be accommodated in the width of the WAC column. The table as codified has been divided into two tables covering the "TWO-LEG BRIDLE OR BASKET HITCH" for 6x19 Classification and for 6x37 Classification. Part One has Rope Diameter in Inches for Vertical and 60° within the two classifications. Part Two has Rope Diameter in Inches for 45° and 30° within the two classifications.]



**TWO - LEG BRIDLE OR BASKET HITCH**  
(TABLE G-3: Part 1--Vertical and 60° Positions)

Rope Dia. Inches	Vertical			60° 		
	A	B	C	A	B	C
<b>6X19 CLASSIFICATION</b>						
1/4"	1.2	1.1	1.0	1.0	.97	.92
3/8"	2.6	2.5	2.3	2.3	2.1	2.0
1/2"	4.6	4.4	3.9	4.0	3.8	3.4
5/8"	7.2	6.8	6.0	6.2	5.9	5.2
3/4"	10.	9.7	8.4	8.9	8.4	7.3
7/8"	14.	13.	11.	12.	11.	9.6
1"	18.	17.	14.	15.	15.	12.
1-1/8"	23.	21.	18.	19.	18.	16.
<b>6X37 CLASSIFICATION</b>						
1-1/4"	26.	24.	21.	23.	21.	18.
1-3/8"	32.	29.	25.	28.	25.	22.
1-1/2"	38.	35.	30.	33.	30.	26.
1-3/4"	51.	47.	41.	44.	41.	35.
2"	66.	61.	53.	57.	53.	46.
2-1/4"	83.	76.	66.	72.	66.	57.

**TWO - LEG BRIDLE OR BASKET HITCH**  
(TABLE G-3: Part 2--45° and 30° Positions)

Rope Dia. Inches	45° 			30° 		
	A	B	C	A	B	C
<b>6X19 CLASSIFICATION</b>						
1/4"	.83	.79	.75	.59	.56	.53
3/8"	1.8	1.8	1.6	1.3	1.2	1.1
1/2"	3.2	3.1	2.8	2.3	2.2	2.0
5/8"	5.1	4.8	4.2	3.6	3.4	3.0
3/4"	7.2	6.9	5.9	5.1	4.9	4.2
7/8"	9.8	9.3	7.8	6.9	6.6	5.5
1"	13.	12.	10.	9.0	8.5	7.2
1-1/8"	16.	15.	13.	11.	10.	9.0
<b>6X37 CLASSIFICATION</b>						
1-1/4"	19.	17.	15.	13.	12.	10.
1-3/8"	22.	21.	18.	16.	15.	13.
1-1/2"	27.	25.	21.	19.	17.	15.

**TWO - LEG BRIDLE OR BASKET HITCH**  
(TABLE G-3: Part 2--45° and 30° Positions)

Rope Dia. Inches	45° 			30° 		
	A	B	C	A	B	C
1-3/4"	36.	33.	29.	26.	24.	20.
2"	47.	43.	37.	33.	30.	26.
2-1/4"	58.	54.	47.	41.	38.	33.

(A) - Socket or swaged terminal attachment.  
(B) - Mechanical sleeve attachment.  
(C) - Hand tucked splice attachment.

TABLE G-4

RATED CAPACITIES FOR  
IMPROVED PLOW STEEL,  
FIBER CORE, WIRE ROPE AND  
WIRE ROPE SLINGS  
(in tons of 2000 pounds)

SINGLE LEG

Rope Dia. Inches	Vertical			Choker		
	A	B	C	A	B	C
<b>6X19 CLASSIFICATION</b>						
1/4	.55	.51	.49	.41	.38	.37
3/8	1.2	1.1	1.1	.91	.85	.80
1/2	2.1	2.0	1.8	1.6	1.5	1.4
5/8	3.3	3.1	2.8	2.5	2.3	2.1
3/4	4.8	4.4	3.9	3.6	3.3	2.9
7/8	6.4	5.9	5.1	4.8	4.5	3.9
1	8.4	7.7	6.7	6.3	5.8	5.0
1-1/8	10.	9.5	8.4	7.9	7.1	6.3
<b>6X37 CLASSIFICATION</b>						
1-1/4	12.	11.	9.8	9.2	8.3	7.4
1-3/8	15.	13.	12.	11.	10.	8.9
1-1/2	17.	16.	14.	13.	12.	10.
1-3/4	24.	21.	19.	18.	16.	14.
2	31.	28.	25.	23.	21.	18.


(A) - Socket or swaged terminal attachment.  
(B) - Mechanical sleeve attachment.  
(C) - Hand tucked splice attachment.

TABLE G-5

RATED CAPACITIES FOR IMPROVED PLOW  
STEEL, FIBER CORE, WIRE ROPE SLINGS  
(in tons of 2000 pounds)

[Codification note: The graphic presentation of this table has been varied slightly in order that it would fall within the printing specifications for the Washington Administrative Code. The following table was too wide to be accommodated in the width of the WAC column. The table as codified has been divided into two tables covering the "TWO - LEG BRIDLE OR BASKET HITCH" for 6x19 Classification and for 6x37 Classification. Part One has Rope Diameter in Inches for Vertical and 60° within the two classifications. Part Two has Rope Diameter in Inches for 45° and 30° within the two classifications.]



TWO - LEG BRIDLE OR BASKET HITCH  
(TABLE G-5: Part 1--Vertical and 60° Positions)

Rope Dia. Inches	Vertical			60° 		
	A	B	C	A	B	C
6X19 CLASSIFICATION						
1/4	1.1	1.0	.99	.95	.88	.85
3/8	2.4	2.2	1.9	2.1	1.9	1.8
1/2	4.3	3.9	3.7	3.7	3.4	3.2
5/8	6.7	6.2	5.6	5.8	5.3	4.8
3/4	9.5	8.8	7.8	8.2	7.6	6.8
7/8	13.	12.	10.	11.	10.	8.9
1	17.	15.	13.	14.	13.	11.
1-1/8	21.	19.	17.	18.	16.	14.

6X37 CLASSIFICATION

1-1/4	25.	22.	20.	21.	19.	17.
1-3/8	30.	27.	24.	26.	23.	20.
1-1/2	35.	23.	28.	30.	27.	24.
1-3/4	48.	43.	38.	41.	37.	33.
2	62.	55.	49.	53.	48.	43.



TWO - LEG BRIDLE OR BASKET HITCH  
(TABLE G-5: Part 2--45° and 30° Positions)

Rope Dia. Inches	45° 			30° 		
	A	B	C	A	B	C

6X19 CLASSIFICATION

1/4	.77	.72	.70	.55	.51	.49
3/8	1.7	1.6	1.5	1.2	1.1	1.1

TWO - LEG BRIDLE OR BASKET HITCH  
(TABLE G-5: Part 2--45° and 30° Positions)

Rope Dia. Inches	45° 			30° 		
	A	B	C	A	B	C
1/2	3.0	2.8	2.6	2.1	2.0	1.8
5/8	4.7	4.4	4.0	3.3	3.1	2.8
3/4	6.7	6.2	5.5	4.8	4.4	3.9
7/8	9.1	8.4	7.3	6.4	5.9	5.1
1	12.	11.	9.4	8.4	7.7	6.7
1-1/8	15.	13.	12.	10.	9.5	8.4

6X37 CLASSIFICATION

1-1/4	17.	16.	14.	12.	11.	9.8
1-3/8	21.	19.	17.	15.	13.	12.
1-1/2	25.	22.	20.	17.	16.	14.
1-3/4	34.	30.	27.	24.	21.	19.
2	43.	39.	35.	31.	28.	25.

- (A) - Socket or swaged terminal attachment.
- (B) - Mechanical sleeve attachment.
- (C) - Hand tucked splice attachment.

TABLE G-6

NUMBER AND SPACING OF U-BOLT WIRE ROPE CLIPS

Improved plow steel rope diameter inches	Number of Clips		Minimum spacing (inches)
	Drop forged	Other material	
* . . . . .	. . .	. . .	
1/2	3	4	3
5/8	3	4	3 3/4
3/4	4	5	4 1/2
7/8	4	5	5 1/4
1	4	6	6
1 1/8	5	6	6 3/4
1 1/4	5	7	7 1/2
1 3/8	6	7	8 1/4
1 1/2	6	8	9

\*Three clips shall be used on wire size less than 1/2-inch diameter.

TABLE G-7

WROUGHT IRON CHAIN  
(in pounds or tons of 2000 pounds)

Nominal Size Chain Stock Inch	Single Leg	60°	45°	30°
* 1/4	1060	1835	1500	1060
* 5/16	1655	2865	2340	1655
3/8	2385	2.1	3370	2385
* 7/16	3250	2.8	2.3	3250
1/2	12.1	13.7	13.0	12.1
* 9/16	12.7	14.6	13.8	12.7
5/8	13.3	15.7	14.7	13.3
3/4	14.8	18.3	16.7	14.8
7/8	16.5	11.2	19.2	16.5
1	18.5	14.7	12.0	18.5
1-1/8	10.0	17.3	14.2	10.0
1-1/4	12.4	21.4	17.5	12.4
1-3/8	15.0	25.9	21.1	15.0
1-1/2	17.8	30.8	25.2	17.8
1-5/8	20.9	36.2	29.5	20.9
1-3/4	24.2	42.0	34.3	24.2
1-7/8	27.6	47.9	39.1	27.6
2	31.6	54.8	44.8	31.6

\*These sizes of wrought iron chain are no longer manufactured in the United States.

TABLE G-8

ALLOY STEEL CHAIN  
(in tons of 2000 pounds)

Nominal Size Chain Stock Inch	Single Leg	60°	45°	30°
1/4	1.62	2.82	2.27	1.62
3/8	3.30	5.70	4.65	3.30
1/2	5.62	9.75	7.90	5.62
5/8	8.25	14.25	11.65	8.25
3/4	11.5	19.9	16.2	11.5
7/8	14.3	24.9	20.3	14.3
1	19.3	33.4	27.3	19.8
1-1/8	22.2	38.5	31.5	22.2
1-1/4	28.7	49.7	40.5	28.7
1-3/8	33.5	58.0	47.0	33.5
1-1/2	39.7	68.5	56.0	39.7
1-5/8	42.5	73.5	59.5	42.5
1-3/4	47.0	81.5	62.0	47.0

TABLE G-9

MAXIMUM ALLOWABLE WEAR AT ANY POINT OF LINK

Chain size in inches	Maximum allowable wear in fraction of inches
1/4 (9/32)	3/64
3/8	5/64
1/2	7/64
5/8	9/64
3/4	5/32
7/8	1 1/64
1	3/16
1 1/8	7/32
1 1/4	1/4
1 3/8	9/32
1 1/2	5/16
1 3/4	1 1/32

TABLE G-10

SAFE WORKING LOADS FOR SHACKLES  
(in tons of 2,000 pounds)

Material size (inches)	Pin diameter (inches)	Safe working load
1/2	5/8	1.4
5/8	3/4	2.2
3/4	7/8	3.2
7/8	1	4.3
1	1 1/8	5.6
1 1/8	1 1/4	6.7
1 1/4	1 3/8	8.2
1 3/8	1 1/2	10.0
1 1/2	1 5/8	11.9
1 3/4	2	16.2
2	2 1/4	21.2

TABLE I-1

FILTER LENSES FOR PROTECTION AGAINST RADIANT ENERGY

Operation	Shade No.
Soldering	2
Torch brazing	3 or 4
Light cutting, up to 1 inch	3 or 4
Medium cutting, 1-6 inches	4 or 5
Light gas welding, up to 1/8 inch	4 or 5
Medium gas welding 1/8-1/2 inch	5 or 6
Heavy gas welding, over 1/2 inch	6 or 8
Shielded metal-arc welding 1/16- to 5/32-inch electrodes	10
Inert-gas metal-arc welding (nonferrous) 1/16- to 5/32-inch electrodes	11

Operation	Shade No.
Inert-gas metal-arc welding (ferrous) 1/16- to 5/32-inch electrodes .....	12
Shielded metal-arc welding:	
3/16- to 1/4-inch electrodes .....	12
5/16- and 3/8-inch electrodes .....	14
Atomic hydrogen welding .....	10 to 14
Carbon arc welding .....	14

[Order 74-25, § 296-304-07013, filed 5/7/74.]

**WAC 296-304-080 Tools and related equipment--**  
**Scope and application.** All sections of this chapter which include WAC 296-304-080 in the section number apply to tools and related equipment.

[Order 74-25, § 296-304-080, filed 5/7/74.]

**WAC 296-304-08001 General precautions.** (1) Hand lines, slings, tackles of adequate strength, or carriers such as tool bags with shoulder straps shall be provided and used to handle tools, materials, and equipment so that employees will have their hands free when using ship's ladders and access ladders. The use of hose or electric cords for this purpose is prohibited.

(2) When air tools of the reciprocating type are not in use, the discs and tools shall be removed.

(3) All portable, power-driven circular saws shall be equipped with guards above and below the base plate or shoe. The upper guard shall cover the saw to the depth of the teeth, except for the minimum arc required to permit the base to be tilted for bevel cuts. The lower guard shall cover the saw to the depth of the teeth, except for the minimum arc required to allow proper retraction and contact with the work. When the tool is withdrawn from the work, the lower guard shall automatically and instantly return to the covering position.

(4) The moving parts of machinery on dry docks shall be guarded.

(5) Before use, pneumatic tools shall be secured to the extension hose or whip by some positive means to prevent the tool from becoming accidentally disconnected from the whip.

(6) The moving parts of drive mechanisms, such as gearing and belting on large portable tools, shall be adequately guarded.

(7) Headers, manifolds, and widely spaced hose connections on compressed air lines shall bear the word "air" in letters at least 1 inch high, which shall be painted either on the manifold or separate hose connections, or on signs permanently attached to the manifolds or connections. Grouped air connections may be marked in one location.

(8) Before use, compressed air hose shall be examined. Visibly damaged and unsafe hose shall not be used.

[Order 76-7, § 296-304-08001, filed 3/1/76; Order 74-25, § 296-304-08001, filed 5/7/74.]

**WAC 296-304-08003 Portable electric tools.** (1) The frames of portable electric tools and appliances, except double insulated tools approved by Underwriters'

[Title 296 WAC—p 2164]

Laboratories, shall be grounded either through a third wire in the cable containing the circuit conductors or through a separate wire which is grounded at the source of the current.

(2) Grounding circuits, other than by means of the structure of the vessel on which the tool is being used, shall be checked to ensure that the circuit between the ground and the grounded power conductor has resistance which is low enough to permit sufficient current to flow to cause the fuse or circuit breaker to interrupt the current.

(3) Portable electric tools which are held in the hand shall be equipped with switches of a type which must be manually held in the closed position.

(4) Worn or frayed electric cables shall not be used.

(5) The employer shall notify the officer in charge of the vessel before using electric power tools operated with the vessel's current.

[Order 74-25, § 296-304-08003, filed 5/7/74.]

**WAC 296-304-08005 Hand tools.** (1) Employers shall not issue or permit the use of unsafe hand tools.

(2) Wrenches, including crescent, pipe, end and socket wrenches, shall not be used when jaws are sprung to the point that slippage occurs.

(3) Impact tools, such as drift pins, wedges, and chisels, shall be kept free of mushroomed heads.

(4) The wooden handles of tools shall be kept free of splinters or cracks and shall be kept tight in the tool.

[Order 74-25, § 296-304-08005, filed 5/7/74.]

**WAC 296-304-08007 Abrasive wheels.** (1) Floor stand and bench mounted abrasive wheels used for external grinding shall be provided with safety guards (protection hoods). The maximum angular exposure of the grinding wheel periphery and sides shall be not more than 90 degrees, except that when work requires contact with the wheel below the horizontal plane of the spindle, the angular exposure shall not exceed 125 degrees. In either case the exposure shall begin not more than 65 degrees above the horizontal plane of the spindle. Safety guards shall be strong enough to withstand the effect of a bursting wheel.

(2) Floor and bench mounted grinders shall be provided with work rests which are rigidly supported and readily adjustable. Such work rests shall be kept a distance not to exceed 1/8 inch from the surface of the wheel.

(3) Cup type wheels use for external grinding shall be protected by either a revolving cup guard or a band type guard in accordance with the provisions of the United States of American Standard Safety Code for the Use, Care, and Protection of Abrasive Wheels, B7.1.1970. All other portable abrasive wheels used for external grinding shall be provided with safety guards (protection hoods) meeting the requirements of (5) of this section, except as follows:

(a) When the work location makes it impossible, in which case a wheel equipped with safety flanges as described in (6) of this section shall be used.

(b) When wheels 2 inches or less in diameter which are securely mounted on the end of a steel mandrel are used.

(4) Portable abrasive wheels used for internal grinding shall be provided with safety flanges (protection flanges) meeting the requirements of (6) of this section, except as follows:

(a) When wheels 2 inches or less in diameter which are securely mounted on the end of a steel mandrel are used.

(b) If the wheel is entirely within the work being ground while in use.

(5) When safety guards are required, they shall be so mounted as to maintain proper alignment with the wheel, and the guard and its fastenings shall be of sufficient strength to retain fragments of the wheel in case of accidental breakage. The maximum angular exposure of the grinding wheel periphery and sides shall not exceed 180 degrees.

(6) When safety flanges are required, they shall be used only with wheels designed to fit the flanges. Only safety flanges of a type and design and properly assembled so as to insure that the pieces of the wheel will be retained in case of accidental breakage shall be used.

(7) All abrasive wheels shall be closely inspected and ring tested before mounting to ensure that they are free from cracks or defects.

(8) Grinding wheels shall fit freely on the spindle and shall not be forced on. The spindle nut shall be tightened only enough to hold the wheel in place.

(9) The power supply shall be sufficient to maintain the rated spindle speed under all conditions of normal grinding. The rated maximum speed of the wheel shall not be exceeded.

(10) All employees using abrasive wheels shall be protected by eye protection equipment in accordance with requirements of WAC 296-304-09001 (1) and (2), except when adequate eye protection is afforded by eye shields which are permanently attached to the bench or floor stand.

[Order 74-25, § 296-304-08007, filed 5/7/74.]

**WAC 296-304-08009 Powder actuated fastening tools.** Powder actuated fastening tool operators shall comply with; and tools shall be designed, constructed, maintained and used in accordance with the requirements specified in WAC 296-24-66201 through 296-24-66225.

[Order 76-7, § 296-304-08009, filed 3/1/76; Order 74-25, § 296-304-08009, filed 5/7/74.]

**WAC 296-304-08011 Internal combustion engines, other than ship's equipment.** (1) When internal combustion engines, furnished by the employer are used in a fixed position below decks, for such purposes as driving pumps, generators, and blowers, the exhaust shall be led to the open air, clear of any ventilation intakes and openings through which it might enter the vessel

(2) All exhaust line joints and connections shall be checked for tightness immediately upon starting the engine, and any leaks shall be corrected at once.

(3) When internal combustion engines on vehicles, such as forklifts and mobile cranes, or on portable equipment such as fans, generators, and pumps exhaust into the atmosphere below decks, the competent person shall make tests of the carbon monoxide content of the atmosphere as frequently as conditions require to ensure that dangerous concentrations do not develop. Employees shall be removed from the compartment involved when the carbon monoxide concentration exceeds 50 parts per million (0.005%). The employer shall use blowers sufficient in size and number and so arranged as to maintain the concentration below this allowable limit before work is resumed.

[Order 74-25, § 296-304-08011, filed 5/7/74.]

**WAC 296-304-090 Personal protective equipment-- Scope and application.** All sections of this chapter which include WAC 296-304-090 in the section number apply to personal protective equipment.

[Order 74-25, § 296-304-090, filed 5/7/74.]

**WAC 296-304-09001 Eye protection.** (1) General precautions.

(a) All eye protection equipment required by these regulations shall meet the specifications prescribed by the American Standard Safety Code for Head, Eye and Respiratory Protection, Z2.1.

(b) Eye protection equipment shall be maintained in good condition.

(c) Eye protection equipment which has previously been used shall be cleaned and disinfected before it is issued by the employer to another employee.

(d) Employees who wear corrective spectacles while engaged in eye hazardous work shall be protected by eye protection equipment of a type which can be worn over personal spectacles, except that glasses with prescription ground safety lenses may be worn in lieu of cover goggles when such glasses provide suitable protection against the hazard involved.

(2) Protection against impact.

(i) In any operations such as chipping, caulking, drilling, riveting, grinding, and pouring babbitt metal, in which the eye hazard of flying particles, molten metal, or liquid chemical exists, employees shall be protected by suitable face shields or goggles meeting the requirements of (1) of this section.

(3) Protection against radiant energy.

(a) In any operation in which the eye hazard of injurious light rays or other radiant energy exists, depending upon the intensity of the radiation to which employees are exposed, they shall be protected by spectacles, cup goggles, helmets, hand shields, or face shields equipped with filter lenses meeting the requirements of (1) and (3)(b) of this section.

(b) Filter lenses shall be of a shade number appropriate to the type of work to be performed as indicated in Table I-1 in WAC 296-304-07011, except that variations of one or two shade numbers are permissible to suit individual preferences.

(c) If filter lenses are used in the goggles worn under the helmet, the shade number of the lens in the helmet



may be reduced so that the sum of the shade numbers of the two lenses will equal the value shown in Table I-1 in WAC 296-304-07011.

[Order 76-7, § 296-304-09001, filed 3/1/76; Order 74-25, § 296-304-09001, filed 5/7/74.]

**WAC 296-304-09003 Respiratory protection.** The respiratory protection requirements of the general occupational health standards, chapter 296-62 WAC, shall apply.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 83-24-013 (Order 83-34), § 296-304-09003, filed 11/30/83; Order 74-25, § 296-304-09003, filed 5/7/74.]

**WAC 296-304-09005 Head, foot and body protection.** (1) When employees are working in areas where there is danger of falling objects they shall be protected by protective hats.

(2) Protective hats shall meet the specifications contained in the United States of America Standard Safety Code for Head, Eye, and Respiratory Protection, Z89.1-1969. Hats without dielectric strength shall not be used where there is the possibility of contact with electric conductors.

(3) Protective hats which have been previously worn shall be cleaned and disinfected before they are issued by the employer to another employee.

(4) The employer shall arrange through means, such as vendors or local stores, or otherwise, to make safety shoes readily available to all employees, and shall encourage their use. Metal toe caps from which the covering has been worn shall be insulated when employees are working on exposed energized circuits of the vessel's electrical systems.

(5) Employees shall not be permitted to wear excessively greasy clothing when performing hot work operations.

(6) Employees shall be protected by suitable gloves when engaged in operations hazardous to their hands.

[Order 74-25, § 296-304-09005, filed 5/7/74.]

**WAC 296-304-09007 Lifesaving equipment.** (1) Personal flotation devices.

(a) Any personal flotation device shall be approved by the U.S. Coast Guard as a Type I PFD, Type II PFD, Type III PFD, or Type V PFD, or their equivalent, pursuant to 46 CFR 160 (Coast Guard Table of Devices Equivalent to Personal Flotation Devices.)

(b) Prior to each use, personal flotation devices shall be inspected for dry rot, chemical damage, or other defects which may affect their strength and buoyancy. Defective personal flotation devices shall not be used.

(2) Safety belts and lifelines.

(a) Safety belts shall be equipped with lifelines which in use are secured with a minimum of slack to a fixed structure.

(b) Prior to each use, belts and lifelines shall be inspected for dry rot, chemical damage, or other defects which may affect their strength. Defective belts and lifelines shall not be used.

[Title 296 WAC—p 2166]

(c) When employees are working in any location requiring a safety belt and a lifeline, care shall be exercised to ensure that the lifeline is not cut, pinched, or led over a sharp edge. In hot work operations or those involving the use of acids, solvents, or caustics, the line shall be kept clear to avoid its being burned or weakened. In order to keep the lifeline continuously attached with a minimum of slack to a fixed structure the attachment point of the lifeline shall be appropriately changed as the work progresses.

(3) Life rings and ladders.

(a) At least three 30 inch Coast Guard approved life rings with lines attached shall be kept in easily visible and readily accessible places aboard each vessel afloat on which work is being performed. Life rings shall be located, one forward, one aft, and one on the gangway, except on vessels under 200 feet in length, in which case one at the gangway will be sufficient.

(b) At least one life ring with a line attached shall be located on each staging float alongside a vessel on which work is being performed.

(c) At least 90 feet of line shall be attached to each life ring. Life rings and lines shall be maintained in good condition.

(d) In the vicinity of each vessel afloat on which work is being performed there shall be at least one portable or permanent ladder of sufficient length to assist employees to reach safety in the event that they fall into the water.

[Order 76-7, § 296-304-09007, filed 3/1/76; Order 74-25, § 296-304-09007, filed 5/7/74.]

**WAC 296-304-100 Ship's machinery and piping systems—Scope and application.** All sections of this chapter which include WAC 296-304-100 in this section number apply to ship's machinery and piping systems and sections WAC 296-304-10001 to 296-304-10007 apply only to shipbuilding and ship repairing.

[Order 74-25, § 296-304-100, filed 5/7/74.]

**WAC 296-304-10001 Ship's boilers.** (1) Before work is performed in the fire, steam, or water spaces of a boiler where employees may be subject to injury from the direct escape of a high temperature medium, such as steam, or water, oil, or other medium at a high temperature entering from an interconnecting system, the employer shall insure that the following steps are taken:

(a) The isolation and shutoff valves connecting the dead boiler with the live system or systems shall be secured, blanked, and tagged indicating that employees are working in the boiler. This tag shall not be removed nor the valves unblanked until it is determined that this may be done without creating a hazard to the employees working in the boiler, or until the work in the boiler is completed. Where valves are welded instead of bolted at least two isolation and shutoff valves connecting the dead boiler with the live system or systems shall be secured, locked and tagged.

(b) Drain connections to atmosphere on all of the dead interconnecting systems shall be opened for visual observation of drainage.

(d) A warning sign calling attention to the fact that employees are working in the boilers shall be hung in a conspicuous location in the engine room. This sign shall not be removed until it is determined that the work is completed and all employees are out of the boilers.

[Order 74-25, § 296-304-10001, filed 5/7/74.]

**WAC 296-304-10003 Ship's piping systems.** (1) Before work is performed on a valve, fitting, or section of piping in a piping system where employees may be subject to injury from the direct escape of steam, or water, oil, or other medium at a high temperature, the employer shall insure that the following steps are taken:

(a) The isolation and shutoff valves connecting the dead system with the live system or systems shall be secured, blanked, and tagged indicating that employees are working on the systems. This tag shall not be removed nor the valves unblanked until it is determined that this may be done without creating a hazard to the employees working on the system, or until the work on the system is completed. Where valves are welded instead of bolted at least two isolation and shutoff valves connecting the dead system with the live system or systems shall be secured, locked, and tagged.

(b) Drain connections to atmosphere on all of the dead interconnecting systems shall be opened for visual observation of drainage.

[Order 74-25, § 296-304-10003, filed 5/7/74.]

**WAC 296-304-10005 Ship's propulsion machinery.** (1) Before work is performed on the main engine, reduction gear, or connecting accessories, the employer shall ensure that the following steps are taken:

(a) The jacking gear shall be engaged to prevent the main engine from turning over. A sign shall be posted at the throttle indicating that the jacking gear is engaged. This sign shall not be removed until the jacking gear can be safely disengaged.

(b) If the jacking gear is steam driven, the stop valves to the jacking gear shall be secured, locked, and tagged indicating that employees are working on the main engine.

(c) If the jacking gear is electrically driven, the circuit controlling the jacking gear shall be deenergized by tripping the circuit breaker, opening the switch or removing the fuse, whichever is appropriate. The breaker, switch, or fuse location shall be tagged indicating that employees are working on the main engine.

(2) Before the jacking engine is operated, the following precautions shall be taken:

(a) A check shall be made to ensure that all employees, equipment, and tools are clear of the engine, reduction gear, and its connecting accessories.

(b) A check shall be made to ensure that all employees, equipment and tools are free of the propeller.

(3) Before work is started on or in the immediate vicinity of the propeller, a warning sign calling attention to the fact that employees are working in that area shall be hung in a conspicuous location in the engine room. This sign shall not be removed until it is determined that

the work is completed and all employees are free of the propeller.

(4) Before the main engine is turned over (e.g., when warming up before departure or testing after an overhaul) a check shall be made to ensure that all employees, equipment, and tools are free of the propeller.

[Order 76-7, § 296-304-10005, filed 3/1/76; Order 74-25, § 296-304-10005, filed 5/7/74.]

**WAC 296-304-10007 Ship's deck machinery.** (1) Before work is performed on the anchor windlass or any of its attached accessories, the employer shall ensure that the following steps are taken:

(a) The devil claws shall be made fast to the anchor chains.

(b) The riding pawls shall be in the engaged position.

(c) In the absence of devil claws and riding pawls, the anchor chains shall be secured to a suitable fixed structure of the vessel.

[Order 74-25, § 296-304-10007, filed 5/7/74.]

**WAC 296-304-110 Portable, unfired pressure vessels, drums and containers, other than ship's equipment—Scope and application.** All sections of this chapter which include WAC 296-304-110 in the section number apply to portable, unfired pressure vessels, drums and containers, other than ship's equipment and WAC 296-304-11001 to 296-304-11003 applies only to shipbuilding and ship repairing.

[Order 74-25, § 296-304-110, filed 5/7/74.]

**WAC 296-304-11001 Portable air receivers and other unfired pressure vessels.** (1) Portable, unfired pressure vessels, built after the effective date of this regulation, shall be marked and reported indicating that they have been designed and constructed to meet the standards of the American Society of Mechanical Engineers Boiler and Pressure Vessel Code, Section VIII, Rules for Construction of Unfired Pressure Vessels, 1963. They shall be subjected to a hydrostatic pressure test of one and one-half times the working pressure of the vessels.

(2) Portable, unfired pressure vessels, not built to the code requirements of (1) of this section, and built prior to the effective date of this regulation, shall be examined quarterly by a competent person, and approved by the state boiler inspecting division. They shall be subjected yearly to a hydrostatic pressure test of one and one-half times the working pressure of the vessels.

(3) The relief valves on the portable, unfired pressure vessels in (1) and (2) of this section shall be set to the safe working pressure of the vessels, or set to the lowest safe working pressure of the systems, whichever is lower.

(4) A record of such examinations and tests made in compliance with the requirements of (1) and (2) of this section shall be maintained.

[Order 74-25, § 296-304-11001, filed 5/7/74.]

**WAC 296-304-11003 Drums and containers.** (1) Shipping drums and containers shall not be pressurized to remove their contents.

(2) A temporarily assembled pressurized piping system conveying hazardous liquids or gases shall be provided with a relief valve and by-pass to prevent rupture of the system and the escape of such hazardous liquids or gases.

(3) Pressure vessels, drums and containers containing toxic or flammable liquids or gases shall not be stored or used where they are subject to open flame, hot metal, or other sources of artificial heat.

(4) Unless pressure vessels, drums and containers of 30 gallon capacity or over containing flammable or toxic liquids or gases are placed in an out-of-the-way area where they will not be subject to physical injury from an outside source, barriers or guards shall be erected to protect them from such physical injury.

(5) Containers of 55 gallons or more capacity containing flammable or toxic liquid shall be surrounded by dikes or pans which enclose a volume equal to at least 25 percent of the total volume of the containers.

(6) Fire extinguishers adequate in number and suitable for the hazard shall be provided. These extinguishers shall be located in the immediate area where pressure vessels, drums and containers containing flammable liquids or gases are stored or in use. Such extinguishers shall be ready for use at all times.

[Order 74-25, § 296-304-11003, filed 5/7/74.]

**WAC 296-304-120 Electrical machinery--Electrical circuits and distribution boards.** (1) Before an employee is permitted to work on an electrical circuit, except when the circuit must remain energized for testing and adjusting, the circuit shall be deenergized and checked at the point at which the work is to be done to insure that it is actually deenergized. When testing or adjusting an energized circuit a rubber mat, duck board, or other suitable insulation shall be used underfoot where an insulated deck does not exist.

(2) Deenergizing the circuit shall be accomplished by opening the circuit breaker, opening the switch, or removing the fuse, whichever method is appropriate. The circuit breaker, switch, or fuse location shall be tagged to indicate that an employee is working on the circuit. Such tags shall not be removed nor the circuit energized until it is definitely determined that the work on the circuit has been completed.

(3) When work is performed immediately adjacent to an open-front energized board or in back of an energized board, the board shall be covered or some other equally safe means shall be used to prevent contact with any of the energized parts.

Note: WAC 296-304-120 is applicable only to shipbuilding and ship repairing.

[Order 74-25, § 296-304-120, filed 5/7/74.]

**WAC 296-304-130 Gear certification--General provisions.** All sections of this chapter which include WAC 296-304-130 in the section number apply to gear certification.

[Order 74-25, § 296-304-130, filed 5/7/74.]

[Title 296 WAC--p 2168]

**WAC 296-304-13001 Purpose and scope.** (1) The regulations in this part implement WAC 296-304-07001 through 296-304-07013. They provide procedures and standards governing accreditation of persons by the department of labor and industries, for the purpose of certificating shore-based material handling devices, and the manner in which such certification shall be performed.

(2) Accreditation is not required, and the regulations of this part are not applicable, under the following circumstances:

(a) Persons not required to be accredited for gear certification purposes, may, nevertheless, apply for and receive accreditation by the department of labor and industries. The appropriate portions of this section shall apply to persons accredited except insofar as exemptions may be granted.

[Order 74-25, § 296-304-13001, filed 5/7/74.]

**WAC 296-304-13003 Definitions of terms.** (1) "Vessel" means every description of watercraft or other artificial contrivance used or capable of being used, as a means of transportation on water, including special-purpose floating structures not primarily designed for or used as a means of transportation on water.

(2) Except as otherwise noted, "cargo gear," as used in WAC 296-304-140 through 296-304-17023, includes that gear forming a part of a vessel's equipment which is used for the handling of cargo other than bulk liquids, but does not include gear which is used only for handling or holding hoses, handling ships' stores, handling the gangway, or boom conveyor belt systems for the self-unloading of bulk cargo vessels.

(3) With reference to equipment covered by this section.

(a) "Derrick" means—

(i) When applied to vessels' cargo handling gear, a mechanical device for lifting, including a boom which is suspended at its head by a topping lift from a mast, king post, or similar structure, controlled in the horizontal plane by vangs, and used either singly or in pairs with married falls;

(ii) When applied to shore-based material handling devices, a mechanical device intended for lifting, with or without a boom supported at its head by a topping lift from a mast, fixed A frame, or similar structure. The mast or equivalent member may or may not be supported by guys or braces. The boom, where fitted, may or may not be controlled in the horizontal plane by guys (vangs). The term includes shear legs.

(b) "Crane" means a mechanical device intended for lifting or lowering a load and moving it horizontally, in which the hoisting mechanism is an integral part of the machine. A crane may be a fixed or mobile machine.

(c) "Bulk cargo spout" means a spout, which may or may not be telescopic and may or may not have removable sections, but is suspended over the vessel from some overhead structure by wire rope or other means. Such a spout is often used with a "thrower" or "trimming machine." A grain loading spout is an example of those covered by this definition.

(d) "Bulk cargo sucker" means a pneumatic conveyor which utilizes a spout-like device, which may be adjustable vertically and/or laterally, and which is suspended over a vessel from some overhead structure by wire rope or other means. An example of an installation of this nature is the "grain sucker" used to discharge grain from barges.

(4) "Director" means the director of the department of labor and industries, or his authorized representative.

(5) "Bureau" means the Bureau of Labor Standards, U.S. Department of Labor.

(6) "Person" includes any individual, partnership, corporation, agency, association, or organization.

(7) "Competent person" means:

(a) An individual qualified to perform gear certification functions with respect to vessels' cargo handling gear, as specifically set forth in WAC 296-304-17023.

(b) An individual qualified under the provisions of WAC 296-304-180 through 296-304-18003 and 296-304-190 through 296-304-19001 to perform gear certification functions with respect to shore-based material handling devices.

(8) "Ton" means a ton of 2,240 pounds when applied to vessels' cargo handling gear, and a ton of 2,000 pounds when applied to shore-based material handling devices or to shore-type cranes permanently mounted aboard barges or other vessels employed in domestic trade and designed on the basis of the 2,000-pound ton. Capacity ratings may be stated in pounds.

(9) "Nondestructive" examination means examination of structure or parts by electronic, ultrasonic, or other nondestructive examination suitable for the purpose.

[Order 74-25, § 296-304-13003, filed 5/7/74.]

**WAC 296-304-140 Procedure governing accreditation—Scope and application.** All sections of this chapter which include WAC 296-304-140 in the section number apply to procedure governing accreditation.

[Order 74-25, § 296-304-140, filed 5/7/74.]

**WAC 296-304-14001 Application for accreditation.**

(1) Application. Any person seeking accreditation shall file an original and duplicate copy of an application for accreditation with the director of the department of labor and industries, on a form provided by the department of labor and industries, for this purpose. Each application shall be signed and certified by the applicant and, if the applicant is an agency or organization, by a responsible officer of such agency or organization.

(2) Contents of application. The application form shall include the following information:

(a) A statement detailing the applicable types of work performed by the applicant in the past, noting the amount and extent of such work performed within the previous three years, listing representative vessels involved, and including representative job orders if available, or equivalent evidence;

(b) Descriptive details concerning any testing instruments and heat treatment furnaces which are to be used

in conducting required tests or heat treatments. Test reports indicating that instruments meet the accuracy standards set forth in this section shall be included;

(c) A list setting forth the ports in which applicant currently conducts his business as well as those in which he proposes to conduct gear certification activities;

(d) A list of the applicant's responsible qualified personnel, both supervisory and managerial and including any surveyors, with resumes of their individual experience in the testing, examination, inspection and heat treatment of cargo gear. Such list shall include any branch office personnel or surveyors appointed to act in the applicant's behalf in any of the ports of the United States: *Provided, however,* That where the submission of individual resumes would be unduly burdensome because of the large number of persons engaged in the applicant's behalf, the applicant, after stating this fact, need only submit a list of its personnel together with a detailed statement of the qualifications upon which the appointment of surveyors is based;

(e) Names of at least three business references who will furnish information regarding work performed by the applicant;

(f) Any additional information the applicant deems to be pertinent.

[Order 74-25, § 296-304-14001, filed 5/7/74.]

**WAC 296-304-14003 Action upon application.** (1) Upon receipt of an application for accreditation, the director shall approve or deny the application. The director may conduct an investigation, which may include a hearing, prior to approving or denying an application. To the extent he deems appropriate, the director may provide an opportunity to other interested persons to present data and views on the application prior to approval or denial.

(2) Any application which fails to present the information required by the prescribed form may be returned to the applicant with a notation of deficiencies and without prejudice to submission of a new or revised application.

(3) If the application is approved, notice of approval shall be mailed to the applicant. If the application is denied, notice of such denial shall be mailed to the applicant and such denial shall be without prejudice to any subsequent application except where such action is deemed to be in the public interest. In the event an application is denied with prejudice, the provisions of WAC 296-304-14013 shall be applicable.

(4) A copy of the notice of accreditation shall be kept on file by applicant at the applicant's place of business.

[Order 74-25, § 296-304-14003, filed 5/7/74.]

**WAC 296-304-14005 Duration and renewal of accreditation.** The period of accreditation shall not exceed three years. Applications for renewal of accreditation shall be made on the same form as described in WAC 296-304-14001. No accreditation shall expire until action on an application for renewal shall have been finally determined: *Provided,* That such application has been properly executed in accordance with WAC 296-304-

14001 and filed with and received by the director not less than 15 nor more than 60 days prior to the expiration date. A final determination means either the approval or initial denial of the application for renewal. The procedure specified in WAC 296-304-14003 shall be applicable to all applications for renewal.

[Order 74-25, § 296-304-14005, filed 5/7/74.]

**WAC 296-304-14007 Criteria governing accreditation to certificate vessels' cargo gear.** (1) A person applying for accreditation to issue registers and pertinent certificates, to maintain registers and appropriate records, and to conduct initial, annual and quadrennial surveys, shall not be accredited unless he is engaged in one or more of the following activities:

- (a) Classification of vessels;
- (b) Certification of vessels' cargo gear;
- (c) Shipbuilding or ship repairing, or both insofar as related to work on vessels' cargo handling gear;
- (d) Unit and loose gear testing of vessels' cargo handling gear.

(2) Applicants for accreditation under WAC 296-304-14007(1) for operations in coastal or Great Lakes ports who come within WAC 296-304-14007 (1)(b) or (d) shall not be accredited unless they conduct at least 1,500 hours of cargo gear certification work per year.

(3) A person applying for accreditation to carry out tests of loose gear or wire rope, or both, or to carry out heat treatments, and to issue the related certificates, shall be engaged in one or both of the following activities:

- (a) Testing of loose gear or wire rope, or both;
- (b) Heat treatment of chains and loose cargo gear.

(4) A person applying for accreditation shall be staffed by individuals technically qualified to conduct the inspections and examinations and to conduct or supervise tests and heat treatments prescribed in this part. Any representatives, agents or surveyors acting on behalf of a person applying for accreditation in ports in which such operations are conducted shall be similarly qualified.

(a) Accreditation to conduct such nondestructive examination as may be a part of any certification activity may be granted to applicants found competent and equipped to carry out this activity.

(5) Except as noted in WAC 296-304-13501(3), and unless exemptions are granted under WAC 296-304-15001(8), a person applying for accreditation as specified in WAC 296-304-14007(1) shall be prepared to carry out all of the requirements of WAC 296-304-150 through 296-304-15005, 296-304-160 through 296-304-16025, and 296-304-170 through 296-304-17023 except that loose gear and wire rope tests and heat treatments may be carried out by the manufacturer of the gear concerned or by another person accredited specifically for this purpose.

(6) A person applying for accreditation shall have a satisfactory record of performance.

[Order 74-25, § 296-304-14007, filed 5/7/74.]

[Title 296 WAC—p 2170]

**WAC 296-304-14009 Voluntary amendment or termination of accreditation.** The accreditation of any person may be voluntarily amended or terminated upon written request filed with the director.

[Order 74-25, § 296-304-14009, filed 5/7/74.]

**WAC 296-304-14011 Suspension or revocation of accreditation.** The director may suspend or revoke an accreditation of any person for cause. Except in cases of willfulness or cases in which the public interest requires otherwise, before any accreditation is suspended or revoked facts or conduct which may warrant such action shall be called to the attention of the person involved in writing and that person shall be afforded an opportunity to achieve or demonstrate appropriate compliance.

[Order 74-25, § 296-304-14011, filed 5/7/74.]

**WAC 296-304-14013 Reconsideration and review.** (1) Any person aggrieved by the action of the director or his authorized representative in denying, granting, suspending or revoking an accreditation under this section may within 15 days after such action, (a) file a written request for reconsideration thereof by the director or the authorized representative of the director who made the decision in the first instance, or (b) file a written request for review of the decision by the director or an authorized representative of the director, who has taken no part in the action which is the subject for review.

(2) A request for reconsideration shall be granted where the applicant shows that there is additional evidence which may materially affect the decision and that there were reasonable grounds for failure to adduce such evidence in the original proceedings.

(3) Any person aggrieved by the action of the director or authorized representative of the director in denying a request for reconsideration may, within 15 days after the denial of such request, file with the director or his authorized representative a written request for review.

(4) Any person aggrieved by the reconsidered determination of the director or authorized representative of the director, may within 15 days after such determination, file with the director a written request for review.

(5) A request for review shall be granted where reasonable grounds for the review are set forth in the request.

(6) If a request for reconsideration or review is granted, all interested persons shall be afforded an opportunity to present their views.

(7) No cargo gear certification function shall be performed by any person seeking reconsideration or review under this section pending the final decision with respect to such reconsideration or review.

[Order 74-25, § 296-304-14013, filed 5/7/74.]

**WAC 296-304-150 Duties of persons accredited to certificate vessels' cargo gear—Scope and application.** All sections of this chapter which include WAC 296-304-150 in the section number apply to duties of persons accredited to certificate vessels' cargo gear.

[Order 74-25, § 296-304-150, filed 5/7/74.]

**WAC 296-304-15001 General duties--Exemptions.**

(1) Except as noted in WAC 296-304-13501 and 296-304-15001(8), the requirements set forth in WAC 296-304-160 through 296-304-16025 and 296-304-170 through 296-304-17023 shall be strictly adhered to in all testing, examinations, inspections and heat treatments.

(2) Supervision of all testing, examinations, inspections, and heat treatments shall be carried out only by such persons as are listed in the application for accreditation or subsequent supplements thereto, submitted pursuant to this section.

(3) The certificates issued by an accredited person shall be signed and all register entries made only by an authorized agent of such accredited person. No certification shall be issued until any deficiencies considered by the accredited person to constitute a currently unsatisfactory condition have been corrected. Replacement parts shall be of equal or better quality as original equipment and suitable for the purpose. In the event deficiencies remain uncorrected and no certification may therefore be issued, the accredited person shall inform the nearest district office of the department of labor and industries of the circumstances.

(4) Dynamometers or other recording test equipment owned by an accredited person shall have been tested for accuracy within the six months next preceding application for accreditation or renewal of same. Such test shall be performed with calibrating equipment which has been checked in turn so that indications are traceable to the U.S. Bureau of Standards. A copy of test reports shall accompany the application. Where test equipment is not the property of the accredited person, that person shall not issue any certificate based upon the use of such equipment unless its owner has made available a certificate of accuracy based on the requirements of this section, obtained within 1 year prior to such use, and stating the errors of the equipment. Reasonable standards of accuracy shall be met and proof loads adjusted as necessary.

(5) An accredited person shall, upon request, provide the nearest local office of the department of labor and industries with advance information as to scheduled testing or of such other functions as are performed and facilitate the department of labor and industries observation of any such activities as it may desire to witness: *Provided, however,* That tests need not be delayed, except when specifically requested by the department of labor and industries under unusual circumstances.

(6) All cargo gear registers or certificates issued by an accredited person shall be made on forms prescribed or approved by the department of labor and industries.

(7) Unless otherwise instructed by the director in specific instances, any person accredited under WAC 296-304-14007(1) shall accept certificates relating to loose gear or wire rope tests or to heat treatments which are issued by the manufacturer of the gear concerned, by another person accredited specifically by the director for this purpose, or by any other person whose certificates are acceptable to the department of labor and industries. Such certificates shall either be attached as a part of the

vessel's certification or shall be used as the basis for the issuance of the accredited person's own loose gear, wire rope, or heat treatment certificates. In the latter case, the original certificates shall be kept on file by the accredited person as part of the permanent record of the vessel concerned.

(8) In case of practical difficulties or unnecessary hardships, the director in his discretion may grant exemptions from any provision of WAC 296-304-150 through 296-304-15005, 296-304-160 through 296-304-16025 and 296-304-170 through 296-304-17023.

[Order 74-25, § 296-304-15001, filed 5/7/74.]

**WAC 296-304-15003 Recordkeeping and related procedures concerning records in custody of accredited persons.** (1) An accredited person shall maintain records of all work performed under WAC 296-304-160 through 296-304-16025 and 296-304-170 through 296-304-17023.

(2) An accredited person shall maintain a continuous record of the status of the certification of each vessel issued a register by such person.

(3) The records required in (1) and (2) of this section shall be available for examination by the director.

(4) When annual or quadrennial tests, inspections, examinations, or heat treatments are performed by an accredited person, other than the person who originally issued the vessel's register, such accredited person shall furnish copies of any certificates issued and information as to register entries to the person originally issuing the register.

(5) An accredited person shall inform the nearest local office of the department of labor and industries whenever a vessel is initially certificated under these regulations and a register in the prescribed form has been issued.

(6) A copy of each certificate relating to unit tests or thorough examinations, except those issued by the manufacturer and those issued by accredited persons outside of the United States, shall be sent to the nearest local office of the department of labor and industries within 10 days after issuance. Such records shall form a part of the department of labor and industries file on the accredited person.

(7) An accredited person shall promptly notify the nearest local office of the department of labor and industries with respect to any changes in technical personnel, in fee schedules in geographical areas in which operations are conducted, or other pertinent substantial changes in its organization or operations.

[Order 74-25, § 296-304-15003, filed 5/7/74.]

**WAC 296-304-15005 Recordkeeping and related procedures concerning records in custody of the vessel.**

(1) A fully completed and up-to-date register shall be kept in the form prescribed or approved by the department of labor and industries, giving the particulars required with respect to:

(a) The inspections and thorough examinations required by WAC 296-304-16005 (1) and (2).



(b) The thorough examinations required by WAC 296-304-16005(3).

(c) The thorough examinations required by WAC 296-304-16009.

(d) The heat treatment required by WAC 296-304-16007(1) and (2), and 296-304-16013.

(2) Certificates in the form prescribed or approved by the department of labor and industries shall be kept up-to-date, be attached to the register, and shall contain the particulars required with respect to:

(a) The testing and examinations required by WAC 296-304-16003, 296-304-16005(1) and 296-304-16013.

(b) The heat treatment required by WAC 296-304-16007 and 296-304-16013.

(3) The certificates and entries in the register shall be signed by a person qualified under WAC 296-304-17023.

(4) Adequate means shall be provided to enable persons examining the register, or any certificate attached thereto, to identify items of cargo gear referred to therein. Small items of gear, such as shackles, shall bear a mark to indicate that they have been initially tested.

(5) Records shall be kept aboard vessels identifying wire rope or articles of loose gear obtained from time to time and required to be certificated under the regulations of this section.

(6) An accredited person shall instruct the vessel's officers or the vessel's operator if the vessel is unmanned, that the vessel's register and certificates shall be preserved for at least 4 years after the date of the latest entry except in the case of nonrecurring test certificates concerning gear which is kept in use for a longer period, in which event the pertinent certificates shall be retained so long as that gear is continued in use.

(7) In cases where derricks, spouts, suckers, or cranes are mounted permanently aboard barges which remain in domestic inland waters service, the certification documentation shall comply with the provisions of WAC 296-304-20025.

[Order 74-25, § 296-304-15005, filed 5/7/74.]

**WAC 296-304-160 Certification of vessels' cargo gear—Scope and application.** All sections of this chapter which include WAC 296-304-160 in the section number apply to certification of vessels' cargo gear.

[Order 74-25, § 296-304-160, filed 5/7/74.]

**WAC 296-304-16001 General.** (1) Except as noted in WAC 296-304-13501 and as provided in exemptions under WAC 296-304-15001(9), certification performed by accredited persons shall conform to the requirements contained in this section.

(2) Safe working loads assigned to assembled units of gear shall be based on applicable design criteria acceptable to the accredited person. Where no design data on which to base a rating is obtainable, the safe working load ratings assigned shall be based on the owner's information and warranty that those so assigned are correct. Unit test certificates shall state the basis for any such safe working load assignment.

[Title 296 WAC—p 2172]

[Order 74-25, § 296-304-16001, filed 5/7/74.]

**WAC 296-304-16003 Initial tests of cargo gear and tests after alterations, renewals or repairs.** (1) Before being taken into use, hoisting machines, fixed gear aboard vessels accessory thereto, and loose gear and wire rope used in connection therewith, shall be tested and examined and the safe working load thereof certified in the manner set forth in WAC 296-304-170 through 296-304-17023.

(2) Replacement or additional loose gear and wire rope obtained from time to time shall also be tested and examined in the manner set forth in WAC 296-304-16003(1). However, the replacement of a component part of an article of loose gear, such as a sheave, pin, or bushing does not require a new test certificate so long as the new component at least equals in all particulars the part replaced.

(3) In the case of untested gear which has been in use, an initial test in conformance with WAC 296-304-16003(1) shall be carried out: *Provided, however,* That existing standing rigging and wire rope will not be required to be tested but shall be thoroughly examined to ascertain its fitness for continued use in conformance with the requirements of WAC 296-304-16023 and 296-304-16025.

(4) In the case of important alterations or renewals of the machinery and gear and also after repairs due to failure of or damage to other than loose components, a test as required in WAC 296-304-16003(1) shall be carried out.

(5) If the operation in which cargo gear is engaged never utilizes more than a fraction of the safe working load rating, the owner may, at his option, have said gear certificated for, and limited in operation to, a lesser maximum safe working load: *Provided, however,* That the gear concerned is physically capable of operation at the original load rating and the load reduction is not for the purpose of avoiding correction of any deficiency.

(6) In no case shall safe working loads be increased beyond the original design limitations unless such increase is based on engineering calculations by or acceptable to the accredited certification agency, and all necessary structural changes are carried out.

[Order 74-25, § 296-304-16003, filed 5/7/74.]

**WAC 296-304-16005 Periodic tests, examinations and inspections.** After being taken into use, every hoisting machine, all fixed gear aboard vessels accessory thereto and loose gear used in connection therewith, shall be tested, thoroughly examined or inspected as follows:

(1) Derricks with their winches and accessory gear, including the attachments, as a unit; and cranes and other hoisting machines with their accessory gear, as a unit, shall be tested and thoroughly examined every four years in the manner set forth in WAC 296-304-170 through 296-304-17023.

(2) Derricks, their permanent attachments and any other fixed gear the dismantling of which is especially difficult shall be visually inspected every twelve months.



In order to facilitate such inspection all derricks shall be lowered.

(3) All hoisting machines (e.g., cranes, winches), blocks, shackles, and all other accessory gear not included in WAC 296-304-16005(2), shall be thoroughly examined every twelve months by means of a visual examination, supplemented as necessary by other means, such as a hammer test or with electronic, ultrasonic, or other nondestructive methods, carried out as carefully as conditions permit in order to arrive at a reliable conclusion as to the safety of the parts examined. Particular attention shall be paid to the suitability for continued use of all swivels and the pins and bushing of blocks. If necessary, parts of the machines or gear shall be dismantled. If blocks are disassembled, all shell bolt nuts shall be securely locked upon reassembly.

(4) Where a derrick or crane is mounted on a barge hull and ballast tanks within the hull are used to facilitate use of the derrick or crane, or uncontrolled free surface may be a factor, each annual inspection or examination, as required, shall include such inspection as is necessary for the purpose of determining the integrity of any internals contributing to stability under conditions of use. The owner shall provide the accredited person with necessary information on any ballasting arrangements required.

(5) Annual inspection or examination, as required, shall include, among other things, examination of the following:

(a) Derrick heel attachment points. Heel pins may, if possible, be examined by nondestructive examination.

(b) Shrouds and stays necessary in the use of the gear, together with attachment points.

(c) Deck fittings for the securing of vang, topping lifts, and/or preventers.

(d) Means of attachment to the hull of "A" frame or other fixed derrick or crane structure and of mobile types of equipment permanently placed aboard the barge or vessel.

(e) Clamshell buckets or other similar equipment, such as magnets, etc., used in conjunction with a derrick or crane mounted aboard a vessel, with particular attention to closing line wires and sheaves. The accredited person may supplement such examination by requesting any operational tests he may deem appropriate.

(f) Winch and other operating drums for excessive wear or defect.

[Order 74-25, § 296-304-16005, filed 5/7/74.]

**WAC 296-304-16007 Heat treatment.** (1) All chains (other than bridle chains attached to derricks or masts), rings, hooks, shackles, and swivels made of wrought iron, which are used in hoisting or lowering, shall be annealed in accordance with WAC 296-304-17021 at the following intervals:

(a) Half inch and smaller chains, rings, hooks, shackles, and swivels in general use, at least once every six months; and

(b) All other chains, rings, hooks, shackles, and swivels in general use, at least once every twelve months.

(1989 Ed.)

(c) In the case of gear used solely on lifting machinery worked by hand, twelve months shall be substituted for six months in WAC 296-304-16007 (1)(a) and two years for twelve months in WAC 296-304-16007 (1)(b).

(d) When used in this paragraph, the term "in general use" means used on fifty-two or more days in a year. In any case, however, the period between annealings shall not exceed two years.

(2) Chains, rings, hooks, shackles, and swivels made of material other than wrought iron or steel shall be heat treated when necessary in accordance with WAC 296-304-17021(2).

[Order 74-25, § 296-304-16007, filed 5/7/74.]

**WAC 296-304-16009 Exemptions from heat treatment.** Gear made of steel, or gear which contains (as in ball bearing swivels), or is permanently attached to (as with blocks), equipment made of materials which cannot be subjected to heat treatment, shall be exempt from the requirements of WAC 296-304-16007. Such gear, however, shall be thoroughly examined in the manner described in WAC 296-304-16005(3).

[Order 74-25, § 296-304-16009, filed 5/7/74.]

**WAC 296-304-16011 Grace periods.** Grace periods allowed in connection with the requirements of this section are as follows:

(1) Annual or six-month requirements - by the end of the voyage during which they become due;

(2) Quadrennial requirements - within six months after the date when due;

(3) Grace periods shall not be deemed to extend subsequent due dates.

[Order 74-25, § 296-304-16011, filed 5/7/74.]

**WAC 296-304-16013 Gear requiring welding.** Chains or other gear which have been lengthened, altered or repaired by welding, shall be properly heat treated where necessary, and, before again being put into use, shall be tested and reexamined in the manner set forth in WAC 296-304-170 through 296-304-17023.

[Order 74-25, § 296-304-16013, filed 5/7/74.]

**WAC 296-304-16015 Damaged components.** (1) Pursuant to WAC 296-304-18003, any derrick or associated permanent fitting which is deformed in service between surveys shall be subjected to proof test to determine its suitability for continued service. If a proof test indicates that the derrick or associated permanent fitting may be continued in service without repair, a note of the existing deformity shall be made on the test certificate. When, in the opinion of the accredited person, it is unsafe to conduct a proof test with an existing deformity, the derrick or associated permanent fitting shall be replaced or repaired and then subjected to proof test in accordance with WAC 296-304-170 through 296-304-17023.

[Title 296 WAC—p 2173]

(2) Any loose gear components which are injured or deformed by a proof load shall be replaced before a certificate is issued.

(3) Any derrick, other fixed installation, or associated permanent fitting, which is injured or deformed by a proof load shall be replaced or repaired and another proof load test shall be conducted without damage before a certificate is issued.

[Order 74-25, § 296-304-16015, filed 5/7/74.]

**WAC 296-304-16017 Marking and posting of safe working loads.** (1) The safe working load of the assembled gear and the minimum angle to the horizontal at which this load may be applied shall be plainly marked at the heels of all booms along with the date of the test. Where gear is certificated for use in union purchase, the union purchase safe working load shall also be plainly marked. Any limitations shall be noted in the vessel's papers.

(2) The safe working load shall be marked on all blocks used in hoisting or lowering.

(3) When the capacity of the boom of a crane or derrick has been or will be rated in accordance with the variance of its radius, the maximum safe working loads for the various working angles of the boom and the maximum and minimum radius at which the boom may be safely used, shall be conspicuously posted near the controls and visible to the crane operator. Ratings may be stated in pounds. When they are stated in tons of 2,000 pounds, this fact shall be indicated.

[Order 74-25, § 296-304-16017, filed 5/7/74.]

**WAC 296-304-16019 Requirements governing braking devices and power sources.** All types of winches and cranes shall be provided with means to stop and hold the proof load in any position, and the efficiency of such means shall be demonstrated. Electric winches, electrohydraulic winches fitted with electromagnetic or hydraulic brakes at the winch, or electric cranes, shall be equipped so that a failure of the electric power shall stop the motion and set the brakes without any action on the part of the operator. Current for operation of electric winches and cranes during the tests shall be taken from the vessel's circuits. Shore current may be used if it passes through the vessel's main switchboard.

[Order 74-25, § 296-304-16019, filed 5/7/74.]

**WAC 296-304-16021 Means of derrick attachment.** Appropriate measure shall be taken to prevent the foot of a derrick from being accidentally lifted from its socket or support during the test.

[Order 74-25, § 296-304-16021, filed 5/7/74.]

**WAC 296-304-16023 Limitations on use of wire rope.** (1) An eye splice made in any wire rope shall have at least three tucks with a whole strand of rope and two tucks with one-half of the wires cut out of each strand. However, this requirement shall not operate to preclude the use of another form of splice or connection which can be shown to be as efficient.

[Title 296 WAC—p 2174]

(2) Except for eye splices in the ends of wires, each wire rope used in hoisting or lowering, in guying derricks, or as a topping lift, preventer or pendant, shall consist of one continuous piece without knot or splice.

(3) Eyes in the ends of wire rope cargo falls shall not be formed by knots and, in single part falls, shall not be formed by wire rope clips.

(4) The ends of falls shall be secured to the winch drums by clamps, U-bolts, shackles or some other equally strong method. Fiber rope fastenings shall not be used.

(5) Wire rope shall not be used for the vessel's cargo gear if in any length of eight diameters, the total number of visible broken wires exceeds 10 percent of the total number of wires, or if the rope shows other signs of excessive wear, corrosion, or defect. Particular attention shall be given to the condition of those sections of wire rope adjacent to any terminal connections, those sections exposed to abnormal wear, and those sections not normally exposed for examination.

[Order 74-25, § 296-304-16023, filed 5/7/74.]

**WAC 296-304-16025 Limitations on use of chains.** Chains forming a part of vessel's cargo gear shall not be used when, due to stretch, the increase of length of a measured section exceeds five percent, when a link is damaged, or when other external defects are evident. Chains shall not be shortened by bolting, wiring, or knotting.

[Order 74-25, § 296-304-16025, filed 5/7/74.]

**WAC 296-304-170 Certification of vessels—Tests and proof loads—Heat treatment—Competent persons—Scope and application.** All sections of this chapter which include WAC 296-304-170 in the section number apply to certification of vessels: Tests and proof loads; heat treatment; competent persons.

[Order 74-25, § 296-304-170, filed 5/7/74.]

**WAC 296-304-17001 Visual inspection before tests.** Before any test under this WAC 296-304-170 through 296-304-17023 is carried out, a visual inspection of the gear involved shall be conducted and any visibly defective gear shall be replaced or repaired. The provisions of WAC 296-304-16005(4) shall be adhered to.

[Order 74-25, § 296-304-17001, filed 5/7/74.]

**WAC 296-304-17003 Unit proof test—Winches, derricks and gear accessory thereto.** (1) Winches, with the whole of the gear accessory thereto (including derricks, goosenecks, eye plates, eye bolts, or other attachments), shall be tested with a proof load which shall exceed the safe working load as follows:

Safe working load	Proof load
Up to 20 tons . . . . .	25 percent in excess.
20-50 tons . . . . .	5 tons in excess.
Over 50 tons . . . . .	10 percent in excess.

(2) The proof load shall be lifted with the vessel's normal tackle with the derrick at an angle not more than

15 degrees to the horizontal, or, at the designed minimum angle when this is greater, or, when this is impracticable, at the lowest practicable angle. The angle at which the test was made shall be stated in the certificate of test. After the proof load has been lifted, it shall be swung as far as possible in both directions. In applying the proof load, the design factors of the gear concerned will determine whether the load is applied with a single part fall or with a purchase and the certificate of test shall state the means used. Where winches are fitted with mechanical brakes for manual operation they shall be demonstrated to be in satisfactory operating condition.

(3) In the case of heavy lift derrick barges, proof loads shall be applied, except as limited by design and stability considerations, at the maximum and minimum radius for which designed, as well as at any intermediate radius which the surveyor may deem necessary, and shall be swung as far as possible in both directions. Data with respect to each proof load applied shall be entered in the test certificate.

(4) No items of cargo gear furnished by outside sources shall be used as a part of the vessel's gear for the purpose of accomplishing the proof test.

(5) All tests prescribed by this section should in general be carried out by dead load, except that in the case of quadrennial tests, replacements, or renewals, spring or hydraulic balances may be used where dead loads are not reasonably available. However, no exception shall be allowed in the case of gear on new vessels.

(6) The test shall not be regarded as satisfactory unless the indicator remains constant under the proof load for a period of at least 5 minutes.

(7) The safe working load, determined pursuant to the requirements of this section, shall be applicable only to a swinging derrick. When using two fixed derricks in "union purchase" rigs, the safe working load should generally be reduced. It is recommended that owners obtain union purchase safe working load certification based upon design study and analysis by, or acceptable to, a qualified technical office of an accredited gear certification agency, with the recognition that such determinations are valid only for the conditions contemplated in the analysis.

(a) Where both guys and preventers are fitted, union purchase certification shall state whether the guy or the preventer is the working strength member, when the guy is for slewing only, and when the guy and preventor should share working loads as far as practicable.

(8) When necessary in the proof testing of heavy derricks, the appropriate shrouds and stays shall be rigged.

[Order 74-25, § 296-304-17003, filed 5/7/74.]

**WAC 296-304-17005 Unit proof tests--Cranes and gear accessory thereto.** (1) Except as noted in WAC 296-304-17005(5), cranes and other hoisting machines, together with gear accessory thereto, shall be tested with a proof load which shall exceed the safe working load as follows:

Safe working load	Proof load
Up to 20 tons . . . . .	25 percent in excess.
20-50 tons . . . . .	5 tons in excess.
Over 50 tons . . . . .	10 percent in excess.

(2) The proof load shall be lifted and swung as far as possible in both directions. If the jib or boom of the crane has a variable radius, it shall be tested with proof loads, as specified in WAC 296-304-17005(1), at the maximum and minimum radius. In the case of hydraulic cranes, when owing to the limitation of pressure it is impossible to lift a load 25 percent in excess of the safe working load, it will be sufficient to lift the greatest possible load.

(3) Initial proof tests of new cranes shall be made only with a dead load as specified in WAC 296-304-17005(2).

(4) Initial tests of cranes which have been in service, quadrennial tests, or tests associated with replacements or renewals, may be made with spring or hydraulic balances where dead loads are not reasonably available, under the following conditions:

(a) Tests shall be conducted at maximum, minimum, and intermediate radius points, as well as such points in the arc of rotation as meet with the approval of the accredited person.

(b) An additional test shall be conducted with partial load and shall include all functions and movements contemplated in the use of the crane.

(5) In cases where shore-type cranes are mounted permanently aboard barges, the requirements of WAC 296-304-170 through 296-304-17023 with respect to unit proof tests and examinations shall not apply and the applicable requirements of WAC 296-304-200 through 296-304-20025 shall be adhered to with respect to unit proof tests and examinations.

[Order 74-25, § 296-304-17005, filed 5/7/74.]

**WAC 296-304-17007 Limitations on safe working loads and proof loads.** The proof loads specified in WAC 296-304-17003 and 296-304-17005 shall be adjusted as necessary to meet any pertinent limitations based on stability and/or on structural competence at particular radii. Safe working loads shall be reduced accordingly.

[Order 74-25, § 296-304-17007, filed 5/7/74.]

**WAC 296-304-17009 Examinations subsequent to unit tests.** (1) After satisfactory completion of the unit proof load tests required by WAC 296-304-17003 and 296-304-17005, the cargo gear and all component parts thereof shall be given a thorough visual examination, supplemented as necessary by other means, such as a hammer test or with electronic, ultrasonic, or other non-destructive methods, to determine if any of the parts were damaged, deformed, or otherwise rendered unsafe for further use.

(2) When the test of gear referred to in WAC 296-304-17008(1) is being conducted for the first time on a vessel, accessory gear shall be dismantled or disassembled for examination after the test. The sheaves and pins

of the blocks included in this test need not be removed unless there is evidence of deformation or failure.

(3) For subsequent tests such parts of the gear shall be dismantled or disassembled after the test as necessary to determine their suitability for continued service.

(4) When blocks are disassembled all shell bolt nuts shall be securely locked upon reassembly.

(5) In carrying out the requirements of this section, replacement shall be required of:

(a) Any swivel found to have excessive tolerance as a result of wear on any bearing surface.

(b) Pins of blocks found to be shouldered, notched, or grooved from wear, in which case, in addition to replacing the pin, sheave bushings shall be examined for suitability for continued use.

[Order 74-25, § 296-304-17009, filed 5/7/74.]

**WAC 296-304-17011 Proof tests--Loose gear.** (1) Chains, rings, shackles and other loose gear (whether accessory to a machine or not) shall be tested with a proof load equal to that shown against the article in the following table:

Article of gear	Proof load
Chain, ring, hook, shackle or swivel . . . . .	100 percent in excess of the safe working load.
Blocks:	
Single sheave block . . . . .	300 percent in excess of the safe working load. <sup>1</sup>
Multiple sheave block with safe working load up to and including 20 tons . . . . .	100 percent in excess of the safe working load.
Multiple sheave block with safe working load over 20 tons up to and including 40 tons . . . . .	20 tons in excess of the safe working load.
Multiple sheave block with safe working load over 40 tons . . . . .	50 percent in excess of the safe working load.
Pitched chains used with hand-operated blocks and rings, hooks, shackles or swivels permanently attached thereto . . . . .	50 percent in excess of the safe working load.
Hand-operated blocks used with pitched chains and rings, hooks, shackles or swivels permanently attached thereto . . . . .	50 percent in excess of the safe working load.

[Title 296 WAC—p 2176]

<sup>1</sup>The proof load applied to the block is equivalent to twice the maximum resultant load on the eye or pin of the block when lifting the nominal safe working load defined in WAC 296-304-17011 (1)(a) below. The proof load is, therefore, equal to four times the safe working load as defined in WAC 296-304-17011 (1)(a) below or twice the safe working load as defined in WAC 296-304-17011 (1)(b) below.

(a) The nominal safe working load of a single-sheave block should be the maximum load which can be safely lifted by the block when the load is attached to a rope which passes around the sheave of the block.

(b) In the case of a single-sheave block where the load is attached directly to the block instead of to a rope passing around the sheave, it is permissible to lift a load equal to twice the nominal safe working load of the block as defined in WAC 296-304-17011 (1)(a) above.

(c) In the case of a lead block so situated that an acute angle cannot be formed by the two parts of the rope passing over it (i.e., the angle is always 90° or more), the block need not have a greater nominal safe working load than one-half the maximum resultant load which can be placed upon it.

(2) In cases where persons accredited to carry out loose gear tests may be retained to conduct tests of special stevedoring gear as described in WAC 296-56-45001(2), which does not form part of a vessel's equipment, such tests shall adhere to the requirements set forth in WAC 296-56-45001 (2)(a), (b) and (c).

(3) After being tested as required by WAC 296-304-17011(1), and before being taken into use, all chains, rings, hooks, shackles, blocks or other loose gear, except as noted in WAC 296-304-17013, shall be thoroughly examined, the sheaves and pins of the blocks being removed for this purpose, to determine whether any part has been injured or permanently deformed by the test. Shell bolt nuts shall be securely locked upon reassembly. Defective loose gear components shall be replaced before the certificate is issued.

(4) Any certificate relating to shackles, swivels or strength members of single-sheave blocks which have been restored to original dimensions by welding shall state this fact.

[Order 74-25, § 296-304-17011, filed 5/7/74.]

**WAC 296-304-17013 Specially designed blocks and components.** (1) Blocks and connecting components of an unusual nature which are specially designed and constructed as an integral part of a particular lifting unit and are either permanently affixed or of such design that two or more components must be tested together need not be considered as loose gear for purposes of WAC 296-304-17011.

(2) In lieu of the loose gear proof test required by WAC 296-304-17011(1), design data shall be submitted to an accredited certification agency indicating design and material specifications and analysis whereby the designed strength of such gear may be determined.

(3) Subsequent to the test of the lifting unit as a whole, a thorough visual examination shall be made of disassembled parts and an electronic, ultrasonic, or other equally efficient nondestructive examination shall be made of those parts not dismantled to ensure the safe condition of such parts.

[Order 74-25, § 296-304-17013, filed 5/7/74.]

**WAC 296-304-17015 Proof tests--Wire rope.** Wire rope, except as provided in WAC 296-304-16003(2), shall be tested by sample, a piece being tested to destruction, and the safe working load of running ropes, unless otherwise acceptable to the department of labor and industries on the basis of design, shall not exceed one-fifth of the breaking load of the sample tested. In the case of running ropes used in gear with a safe working load exceeding 10 tons, the safe working load shall not exceed one-fourth of the breaking load of the sample tested.

[Order 74-25, § 296-304-17015, filed 5/7/74.]

**WAC 296-304-17017 Proof tests after repairs or alterations.** When proof loads are applied after repairs or alterations, all parts of the assembled gear shall be examined as required in WAC 296-304-17009, 296-304-17011(3), or 296-304-17013(c), whichever is applicable.

[Order 74-25, § 296-304-17017, filed 5/7/74.]

**WAC 296-304-17019 Order of tests.** When both unit and loose gear proof load tests are required, the loose gear test may be carried out after completion of the unit test.

[Order 74-25, § 296-304-17019, filed 5/7/74.]

**WAC 296-304-17021 Heat treatment.** (1) The annealing of wrought iron gear required by this section shall be accomplished at a temperature between 1100° and 1200°F. and the exposure shall be of between thirty and sixty minutes duration. After being annealed, the gear shall be allowed to cool slowly and shall then be carefully inspected. All annealing shall be carried out in a closed furnace.

(2) When heat treatment of loose gear made of other than wrought iron or steel is recommended by the manufacturer, it shall be carried out in accordance with the specifications of the manufacturer.

[Order 74-25, § 296-304-17021, filed 5/7/74.]

**WAC 296-304-17023 Competent persons.** All gear certification functions shall be performed by competent persons as set forth in the following table:

Functions	Competent person
Any testing, examination, inspection, or heat treatment required in United States ports.	Responsible individual, surveyor or other authorized agent of a person accredited by the department of labor and industries under the regulations contained in this part.

Any testing, examination, inspection, or heat treatment required to be

(1989 Ed.)

**Functions**

**Competent person**

performed while the vessel is in other than United States ports.

Responsible individual, surveyor or other authorized agent of persons recognized by the Commandant of the United States Coast Guard or by a foreign nation whose certification is accepted by the department of labor and industries as being in substantial accordance with WAC 296-304-15005(1).

Testing, examination and inspection of loose gear or wire rope; heat treatment of loose gear.

Employees or authorized agents of persons accredited specifically by the department of labor and industries for this purpose under the regulations contained in this section, or the manufacturer of the gear concerned unless disapproved by the director.

[Order 74-25, § 296-304-17023, filed 5/7/74.]

**WAC 296-304-180 Accreditation to certificate shore-based equipment--Scope and application.** All sections of this chapter which include WAC 296-304-180 in the section number apply to accreditation to certificate shore-based equipment.

[Order 74-25, § 296-304-180, filed 5/7/74.]

**WAC 296-304-18001 Eligibility for accreditation to certificate shore-based material handling devices covered by chapter 296-56 WAC of the safety and health regulations for longshoring.** (1) A person applying for accreditation to carry out certification activities and to issue and maintain the requisite records must be:

(a) A manufacturer of cranes or derricks or of specialized equipment of the type for which accreditation application is made, or a person or organization representing such a manufacturer in a technical capacity; or

(b) Technically experienced and qualified to carry out examinations and/or testing, as applicable, of vessels or shore-based equipment or gear of the type for which accreditation application is made.

(2) The owner of shore-based equipment affected may designate a member of his organization to carry out certification functions respecting the owner's equipment, on the following conditions:

(a) The designee is technically experienced and qualified in the inspection and maintenance or design of the type of equipment involved, aside from employment as an operator only.

(b) The designee has applied to an accredited, nationally operating certification agency and has been granted

appointment or equivalent recognition by that agency as a surveyor for the purpose intended.

(c) Certification activities carried out by the designee are cleared through the offices, and are subject to the approval, of the accredited certifying agency. When equipment is found satisfactory for use upon any survey, said equipment may be used pending receipt of notification of such approval or any disapproval.

(d) In cases where equipment is certificated by a person designated by the equipment owner, the cognizant accredited certification agency retains the right to inspect such equipment as desired and convenient, in order to ascertain the adequacy of the certification activity performed.

(3) Accreditation to conduct such nondestructive examination as may be a part of any certification activity may be granted to applicants found competent and equipped to carry out this activity.

(4) Unless exemptions are granted at the discretion of the director in cases of practical difficulties or unnecessary hardship, applicants for accreditation as specified in this section shall be prepared to carry out all necessary functions, except that any requisite wire rope tests, non-destructive examinations, and heat treatments may be carried out by the manufacturer of the gear concerned or by another person accredited specifically for these purposes.

(5) A person applying for accreditation shall have a satisfactory record of relevant experience and performance.

[Order 74-25, § 296-304-18001, filed 5/7/74.]

**WAC 296-304-18003 Provisions respecting application for accreditation, action upon the application, and related matters.** The provisions of WAC 296-304-14001, 296-304-14003, 296-304-14005, 296-304-14009, 296-304-14011 and 296-304-14013 shall govern accreditation to certificate shore-based material handling devices, to the extent applicable.

[Order 74-25, § 296-304-18003, filed 5/7/74.]

**WAC 296-304-190 Duties of persons accredited to certificate shore-based material handling devices--General duties, exemptions.** The requirements of WAC 296-304-200 through 296-304-20025 shall be strictly observed: *Provided, however,* That in cases of practical difficulties or unnecessary hardship, the director in his discretion may grant exemptions or variations from any provision in that section.

(1) Except as otherwise noted in this section, all functions required by WAC 296-304-200 through 296-304-20025 shall be carried out by or under the supervision of a person accredited for the purpose or by his authorized representative.

(2) All required unit proof load tests shall be carried out by the use of weights as a dead load. Only where this is not possible may dynamometers or other recording test equipment be used. Any such recording test equipment owned by an accredited person shall have been tested for accuracy within the 6 months next preceding application for accreditation or renewal thereof.

[Title 296 WAC--p 2178]

Such test shall be performed with calibrating equipment which has been checked in turn so that indications are traceable to the U.S. Bureau of Standards. A copy of test reports shall accompany the accreditation application. Where test equipment is not the property of the accredited person, that person shall not issue any certificate based upon the use of such equipment unless its owner has made available a certificate of accuracy based on the requirements of this section, obtained within the year prior to such use, and stating the errors of the equipment. In any event reasonable standards of accuracy shall be met and proof loads adjusted as necessary.

(3) The qualifications of any person appointed or recognized by any accredited person for the purpose of carrying out certification functions shall meet with the approval of the director.

(4) WAC 296-304-15001 (5) and (7) and 296-304-15003 shall govern, to the extent applicable, persons accredited under WAC 296-304-180 through 296-304-18003.

[Order 74-25, § 296-304-190, filed 5/7/74.]

**WAC 296-304-200 Certification of shore-based material handling devices--Scope and application.** All sections of this chapter which include WAC 296-304-200 in the section number apply to certification of shore-based material handling devices.

[Order 74-25, § 296-304-200, filed 5/7/74.]

**WAC 296-304-20001 General provisions.** (1) Certification of shore-based material handling devices shall conform to the requirements contained in this section, except in cases for which exemptions or variations have been granted by the director as provided in WAC 296-304-18001(4) and 296-304-19001(1).

(2) Any replacements or repairs deemed necessary by the accredited person shall be carried out before application of a proof test.

(3) "Ton" in this section means a ton of 2,000 pounds.

(4) When applied to shore-based material handling devices, ratings may be stated in pounds rather than tons. When stated in tons of 2,000 pounds, this fact shall be indicated.

[Order 74-25, § 296-304-20001, filed 5/7/74.]

**WAC 296-304-20003 Unit proof test and examination of cranes.** (1) Unit proof tests of cranes shall be carried out at the following times:

(a) In the cases of new cranes, before initial use and every 4 years thereafter.

(b) In the cases of uncertificated cranes which have been in use, at the time of initial certification and every 4 years thereafter.

(c) After important alterations and renewals, and after repairs due to failure of, or damage to, major components.

(2) Unit proof load tests of cranes shall be carried out where applicable with the boom in the least stable direction relative to the mounting, based on the manufacturer's specifications.



(3) Unit proof load tests shall be based on the manufacturer's load ratings for the conditions of use and shall, except in the case of bridge type cranes utilizing a trolley, consist of application of a proof load of 10 percent in excess of the load ratings at maximum and minimum radius, and at such intermediate radii as the certifying authority may deem necessary in the circumstances. Trolley equipped cranes shall be subject to a proof load of 25 percent in excess of the manufacturer's load rating. In cases of foreign manufacture, the manufacturer's specifications shall be subject to approval by the certifying authority as being equivalent to U.S. practice.

<sup>1</sup>The manufacturer's load ratings are usually based upon percentage of tipping loads under some conditions and upon limitations of structural competence at others, as well as on other criteria such as type of crane mounting, whether or not outriggers are used, etc. Some cranes utilizing a trolley may have only one load rating assigned and applicable at any outreach. It is important that the manufacturer's ratings be used.

The weight of all auxiliary handling devices such as, but not limited to, magnets, hooks, slings, and clamshell buckets shall be considered part of the load.

(4) An examination shall be carried out in conjunction with each unit proof load test. The accredited person, or his authorized representative, shall make a determination as to correction of deficiencies found. The examination shall cover the following points as applicable:

(a) All functional operating mechanisms shall be examined for improper function, maladjustment, and excessive component wear, with particular attention to sheaves, pins, and drums. The examination shall include operation with partial load, in which all functions and movements, including, where applicable, maximum possible rotation in both directions, are performed.

(b) All safety devices shall be examined for malfunction.

(c) Lines, tanks, valves, drains, pumps, and other parts of air or hydraulic systems shall be examined for deterioration or leakage.

(d) Loose gear components, such as hooks, including wire rope and wire rope terminals and connections, shall be checked with particular attention to sections of wire rope exposed to abnormal wear and to sections not normally exposed for examination. The provisions of WAC 296-304-16023 shall apply in wire rope examinations. Cracked or deformed hooks shall be discarded and not reused on any equipment subject to the provisions of chapter 296-56 WAC longshoring and WAC 296-304-130 through 296-304-13503.

(e) Rope reeving shall comply with manufacturer's recommendations.

(f) Deformed, cracked, or excessively corroded members in crane structure and boom shall be repaired or replaced as necessary.

(g) Loose bolts, rivets, or other connections shall be corrected.

(h) Worn, cracked, or distorted parts affecting safe operation shall be corrected.

(i) Brake and clutch system parts, linings, pawls, and ratchets shall be examined for excessive wear and free operation.

(j) Load, boom angle, or other indicators shall be checked over their full range for any significant inaccuracy. A boom angle or radius indicator shall be fitted.

(k) It shall be ascertained that there is a durable rating chart visible to the operator, covering the complete range of the manufacturer's capacity ratings at all operating radii, for all permissible boom lengths and jib lengths, with alternate ratings for optional equipment affecting such ratings. Necessary precautions or warnings shall be included. Operating controls shall be marked or an explanation of controls shall be posted at the operator's position to indicate function.

(l) Where used, clamshell buckets or other similar equipment such as magnets, etc., shall be carefully examined in all respects, with particular attention to closing line wires and sheaves. The accredited person may supplement such examination by requesting any operational tests as may be appropriate.

(m) Careful examination of the junction areas of removable boom sections, particularly for proper seating, cracks, deformities, or other defects in securing bolts and in the vicinity of such bolts.

(n) It shall be ascertained that no counterweights in excess of the manufacturer's specifications are fitted.

(o) Such other examination or supplemental functional tests shall be made as may be deemed necessary by the accredited person under the circumstances.

[Order 74-25, § 296-304-20003, filed 5/7/74.]

**WAC 296-304-20005 Annual examination of cranes.** (1) In any year in which no quadrennial unit proof test is required, an examination shall be carried out by an accredited person or his authorized representative. Such examination shall be made not later than the anniversary date of the quadrennial certification and shall conform with the requirements of WAC 296-304-20003(4).

[Order 74-25, § 296-304-20005, filed 5/7/74.]

**WAC 296-304-20007 Unit proof test and examination of derricks.** (1) Unit proof tests of derricks shall be carried out at the same times as are specified in WAC 296-304-20003(1) for cranes.

(2) Unit proof load tests and safe working load ratings shall be based on the design load ratings at the ranges of boom angles or operating radii. Unit proof loads shall exceed the safe working load as follows:

Safe working load	Proof load
Up to 20 tons . . . . .	25 percent in excess.
20-50 tons . . . . .	5 tons in excess.
Over 50 tons . . . . .	10 percent in excess.

Proof loads shall be applied at the designed maximum and minimum boom angles or radii, or, if this is impracticable, as close to these as practicable. The angles or radii of test shall be stated in the certificate of test. Proof loads shall be swung as far as possible in both directions. The weight of all auxiliary handling devices shall be considered a part of the load.



(3) After satisfactory completion of a unit proof load test the derrick and all component parts thereof shall be carefully examined in accordance with the requirements of WAC 296-304-20003(4), as far as applicable.

[Order 74-25, § 296-304-20007, filed 5/7/74.]

**WAC 296-304-20009 Annual examination of derricks.** (1) In any year in which no quadrennial unit proof test is required, an examination shall be carried out by an accredited person or his authorized representative. Such annual examination shall be made not later than the anniversary date of the quadrennial certification and shall conform in all applicable respects with WAC 296-304-20003(4).

[Order 74-25, § 296-304-20009, filed 5/7/74.]

**WAC 296-304-20011 Determination of crane or derrick safe working loads and limitations in absence of manufacturer's data.** (1) In the event neither manufacturer's data nor design data on safe working loads (including any applicable limitations) are obtainable, the safe working load ratings assigned shall be based on the owner's information and warranty that those so assigned are correct. Unit test certificates shall state the basis for any such safe working load assignment.

[Order 74-25, § 296-304-20011, filed 5/7/74.]

**WAC 296-304-20013 Safe working load reduction.** (1) If the operation in which equipment is engaged never utilizes more than a fraction of the safe working load rating, the owner of such equipment may, at his option, have the crane or derrick certificated for and operated at a lesser maximum safe working load in keeping with the use and based on radius and other pertinent factors: *Provided, however,* That the equipment concerned is physically capable of operation at the original load rating and the load reduction is not for the purpose of avoiding correction of any deficiency.

[Order 74-25, § 296-304-20013, filed 5/7/74.]

**WAC 296-304-20015 Safe working load increase.** (1) In no case shall safe working loads be increased beyond the manufacturer's ratings or original design limitations unless such increase meets with the manufacturer's approval. Where the manufacturer's services are not available, or where the equipment is of foreign manufacture, engineering design analysis by, or acceptable to, the accredited certification agency is required. All necessary structural changes shall be carried out.

[Order 74-25, § 296-304-20015, filed 5/7/74.]

**WAC 296-304-20017 Nondestructive examination.** (1) Wherever it is considered necessary by the accredited person or his authorized representative and wherever it is practical and advisable to avoid disassembly of equipment, removal of pins, etc., examination of structure or parts by electronic ultrasonic or other nondestructive methods may be carried out, provided that the procedure followed is acceptable to the director and the

person carrying out such examination is accredited or acceptable to the director for the purpose.

[Order 74-25, § 296-304-20017, filed 5/7/74.]

**WAC 296-304-20019 Wire rope.** (1) Wire rope and replacement wire rope shall be of the same size, same or better grade, and same construction as originally furnished by the equipment manufacturer or contemplated in the design, unless otherwise recommended by the equipment or the wire rope manufacturer due to actual working condition requirements. In the absence of specific requirements as noted, wire rope shall be of a size and construction suitable for the purpose, and a safety factor of 4 shall be adhered to, and verified by wire rope test certificate.

(2) Wire rope in use on equipment previously constructed and prior to initial certification of said equipment shall not be required to be tested but shall be subject to thorough examination at the time of initial certification of the equipment.

[Order 74-25, § 296-304-20019, filed 5/7/74.]

**WAC 296-304-20021 Heat treatment.** (1) Whenever heat treatment of any loose gear is recommended by the manufacturer, it shall be carried out in accordance with the specifications of the manufacturer.

[Order 74-25, § 296-304-20021, filed 5/7/74.]

**WAC 296-304-20023 Examination of bulk cargo loading or discharging spouts or suckers.** (1) Those portions of bulk cargo loading or discharging spouts or suckers which extend over vessels, together with any portable extensions, rigging components, outriggers, and attachment points, supporting them or any of their components vertically, shall be examined annually. The examination shall be carried out with particular attention to the condition of wire rope and accessories. The equipment shall not be considered satisfactory unless, in the opinion of the accredited person or his authorized representative, it is deemed fit to serve its intended function.

[Order 74-25, § 296-304-20023, filed 5/7/74.]

**WAC 296-304-20025 Documentation.** (1) Documents issued respecting a certification function by an accredited person shall be on forms approved for such use by the director and shall so state.

(2) Such documents shall be issued by the accredited person to the owners of affected equipment, attesting to satisfactory compliance with applicable requirements. The forms used shall contain the following information:

(a) Unit proof tests where required—

(i) Identification of crane or derrick including manufacturer, model number, serial number, and ownership.

(ii) Basis for assignment of safe working load ratings, with the ratings assigned (i.e., whether based on manufacturer's ratings, whether for any specific service, etc.).

(iii) Proof test details noting radii and proof loads, how applied, and, where applicable, direction relative to mounting.

(iv) A statement that the test and associated examination were conducted and all applicable requirements of this section are met.

(v) Any necessary remarks or supplementary data, including limitations imposed and the reason therefor.

(vi) Name of accredited person and identification of authorized representative actually conducting test and/or examination.

(vii) Authorized signature of accredited person, date and place of test and/or examination.

(b) Annual examination of cranes or derricks—

(i) Information specified in WAC 296-304-20025 (2)(a)(i), (v), (vi) and (vii).

(ii) A statement that the required examination has been carried out and that, in the opinion of the accredited person or his authorized representative, the equipment has been found in compliance in all applicable respects with the requirements of this section.

(c) Annual examination of bulk cargo loadings or discharging spouts or suckers—

(i) Specific identification of equipment.

(ii) A statement that examination has been completed and that, in the opinion of the accredited person or his authorized representative, the equipment meets the criteria of WAC 296-304-20023(1).

(iii) Information specified in WAC 296-304-20025 (2)(a)(i), (v), (vi) and (vii).

(3) Certificates relating to wire rope, whether tested by or under the supervision of the accredited person or by its manufacturer and whether or not issued on the basis of the manufacturer's certificates, shall follow the general format of a wire rope test form approved by the director.

(4) Accredited persons shall advise owners of affected equipment of the necessity for maintaining required documentation or acceptable copies thereof available for inspection at or near the worksite of the equipment involved.

(a) Where initial and periodic tests as well as annual examinations are required, documentation available for inspection shall include the latest unit test certificate and any subsequent annual examination certificates, together with wire rope test certificates relating to any replacements since the last unit test or annual examination.

(b) Where only annual examination is required, documentation available for inspection shall include the latest annual examination certificate and wire rope test certificates relating to any wire replaced since the last annual examination.

(c) In the event that heat treatment of any loose gear is recommended by its manufacturer, the latest heat treatment certificate, attesting to compliance with the manufacturer's specifications, shall be part of the available documentation.

(5) No certification shall be issued until any deficiencies considered by the accredited person to constitute a currently unsatisfactory condition have been corrected. Replacement parts shall be of equal or better quality as

original equipment and suitable for the purpose. In the event deficiencies remain uncorrected and no certification therefore is issued, the accredited person shall inform of the circumstances the nearest district office of the department of labor and industries.

[Order 74-25, § 296-304-20025, filed 5/7/74.]

**Chapter 296-305 WAC  
SAFETY STANDARDS FOR FIRE FIGHTERS**

WAC	
296-305-001	Foreword.
296-305-003	Effective date.
296-305-005	Scope and application.
296-305-007	Definitions.
296-305-010	Variance and procedure.
296-305-015	Injury and illness report for fire fighters.
296-305-017	Accident investigation.
296-305-020	Accident prevention programs.
296-305-025	Employer's responsibility.
296-305-030	Employee's responsibility.
296-305-035	Safe place standards.
296-305-040	First-aid training and certification.
296-305-045	First-aid kits.
296-305-060	Personal protective equipment and clothing.
296-305-06001	Eye and face protection.
296-305-06003	Hearing protection.
296-305-06005	Hand protection.
296-305-06007	Foot protection.
296-305-06009	Body protection.
296-305-06011	Head protection.
296-305-063	Respiratory equipment.
296-305-064	Fire overhaul.
296-305-065	Requirements for fire stations.
296-305-06501	General requirements.
296-305-06503	Sanitation.
296-305-06505	Sleeping areas.
296-305-06507	Apparatus area.
296-305-06509	Refueling areas.
296-305-06511	Hose drying towers.
296-305-06513	Drill towers.
296-305-06515	Fire station equipment and tools.
296-305-06517	Stair and landing protection.
296-305-070	Automotive fire apparatus.
296-305-07001	Design and construction.
296-305-07003	Automotive fire apparatus equipment.
296-305-07005	Apparatus operational rules.
296-305-07007	Apparatus operation communications.
296-305-07009	Maintenance and repair.
296-305-075	Fire service equipment.
296-305-080	Testing fire service equipment.
296-305-085	Fire combat training.
296-305-090	Operations.
296-305-095	Fire overhaul.
296-305-100	Ladders.
296-305-105	Aerial ladders.
296-305-110	Elevated platforms.
296-305-115	Electrical.

**DISPOSITION OF SECTIONS FORMERLY CODIFIED IN THIS CHAPTER**

296-305-06301 Respiratory equipment effective dates. [Statutory Authority: RCW 49.17.040 and 49.17.050. 83-24-013 (Order 83-34), § 296-305-06301, filed 11/30/83; Order 77-20, § 296-305-06301, filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.] Repealed by 88-14-108 (Order 88-11), filed 7/6/88. Statutory Authority: Chapter 49.17 RCW.

- 296-305-06303 Respiratory equipment approvals. [Order 77-20, § 296-305-06303, filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.] Repealed by 88-14-108 (Order 88-11), filed 7/6/88. Statutory Authority: Chapter 49.17 RCW.
- 296-305-06305 Respiratory equipment inspection. [Statutory Authority: RCW 49.17.040 and 49.17.050. 83-24-013 (Order 83-34), § 296-305-06305, filed 11/30/83; Order 77-20, § 296-305-06305, filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.] Repealed by 88-14-108 (Order 88-11), filed 7/6/88. Statutory Authority: Chapter 49.17 RCW.
- 296-305-06307 Respiratory equipment testing. [Statutory Authority: RCW 49.17.040 and 49.17.050. 83-24-013 (Order 83-34), § 296-305-06307, filed 11/30/83; Order 77-20, § 296-305-06307, filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.] Repealed by 88-14-108 (Order 88-11), filed 7/6/88. Statutory Authority: Chapter 49.17 RCW.
- 296-305-06309 Respiratory protection equipment maintenance and repair. [Statutory Authority: RCW 49.17.040 and 49.17.050. 83-24-013 (Order 83-34), § 296-305-06309, filed 11/30/83; Order 77-20, § 296-305-06309, filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.] Repealed by 88-14-108 (Order 88-11), filed 7/6/88. Statutory Authority: Chapter 49.17 RCW.
- 296-305-06311 Respiratory equipment training. [Order 77-20, § 296-305-06311, filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.] Repealed by 88-14-108 (Order 88-11), filed 7/6/88. Statutory Authority: Chapter 49.17 RCW.
- 296-305-06313 Filling air cylinders. [Statutory Authority: RCW 49.17.040 and 49.17.050. 83-24-013 (Order 83-34), § 296-305-06313, filed 11/30/83.] Repealed by 88-14-108 (Order 88-11), filed 7/6/88. Statutory Authority: Chapter 49.17 RCW.
- 296-305-9901 Testing extension ladders—Figure 14. [Order 77-20, Illustration (codified as WAC 296-305-9901), filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.] Repealed by 88-14-108 (Order 88-11), filed 7/6/88. Statutory Authority: Chapter 49.17 RCW.
- 296-305-9902 Testing extension ladders—Figure 15. [Order 77-20, Illustration (codified as WAC 296-305-9902), filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.] Repealed by 88-14-108 (Order 88-11), filed 7/6/88. Statutory Authority: Chapter 49.17 RCW.
- 296-305-9903 Testing extension ladders—Illustration. [Order 77-20, Illustration (codified as WAC 296-305-9903), filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.] Repealed by 88-14-108 (Order 88-11), filed 7/6/88. Statutory Authority: Chapter 49.17 RCW.
- 296-305-9904 Testing extension ladders—Illustration. [Order 77-20, Illustration (codified as WAC 296-305-9904), filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.] Repealed by 88-14-108 (Order 88-11), filed 7/6/88. Statutory Authority: Chapter 49.17 RCW.
- 296-305-9905 Testing extension ladders—Illustration. [Order 77-20, Illustration (codified as WAC 296-305-9905), filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.] Repealed by 88-14-108 (Order 88-11), filed 7/6/88. Statutory Authority: Chapter 49.17 RCW.
- 296-305-9906 Testing extension ladders—Illustration. [Order 77-20, Illustration (codified as WAC 296-305-9906), filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.] Repealed by 88-14-108 (Order 88-11), filed 7/6/88. Statutory Authority: Chapter 49.17 RCW.

**WAC 296-305-001 Foreword.** These fire fighter safety and health standards were adopted by the department of labor and industries in accordance with the provisions of the Washington Industrial Safety and Health Act of 1973 (chapter 49.17 RCW), following extensive research and pursuant to the recommendations of an advisory committee made up of representatives of fire fighting personnel and their employers.

The purpose of this chapter is to assist employers and employees in the reduction of work related injuries and illness. In addition to providing an enforceable set of safety and health standards for the fire protection service, it is the intent of the department that the provisions of this chapter be used to assist both employers and employees in achieving the safest workplaces reasonably attainable under the conditions to which employees are or will be exposed.

[Order 77-20, § 296-305-001, filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.]

**WAC 296-305-003 Effective date.** Unless a particular provision of this chapter specifies otherwise, the effective date of chapter 296-305 WAC, shall be \*(December 17, 1977).

[Order 77-20, § 296-305-003, filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.]

**WAC 296-305-005 Scope and application.** (1) The rules of this chapter shall apply with respect to any and all activities, operations and equipment of employers and employees involved in providing fire protection services which are subject to the provisions of the Washington Industrial Safety and Health Act of 1973 (chapter 49.17 RCW).

(2) The provisions of this chapter apply to all work places where fire fighters are employed, including the fire combat scene. Although enforcement of applicable standards will result from provable violations of these standards which occur at the fire combat scene, agents of the department will not act in any manner that will reduce or interfere with the effectiveness of the emergency response of a fire fighting unit. Activities directly related to the combating of a fire will not be subjected to the immediate restraint provisions of RCW 49.17.130.

(3) The provisions of this chapter shall be supplemented by the provisions of the safety and health standards of the department of labor and industries, chapters 296-24 and 296-62 WAC. In the event of conflict between any provisions of this chapter and any provision of either of the two chapters last cited, the provisions of this chapter shall apply. The requirements of this chapter shall be reviewed by the appropriate labor-management committee at least every two years.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 83-24-013 (Order 83-34), § 296-305-005, filed 11/30/83. Statutory Authority: RCW 49.17.040, 49.17.050, 49.17.240, chapters 42.30 and 43.22 RCW. 78-09-092 (Order 78-16), § 296-305-005, filed 8/31/78; Order 77-20, § 296-305-005, filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.]

**WAC 296-305-007 Definitions.** Unless the context indicates otherwise, words used in this chapter shall have the meaning given in this section.

(1) **Aerial ladder:** A ladder mounted on top of an apparatus, hydraulic or pneumatic controlled.

(2) **Aerial platform:** A device consisting of two or more booms or sections with a passenger carrying platform assembly.

(3) **Aerial tower:** Telescopic elevating platform or water tower assembly usually with a ladder on top of the section.

(4) **Ancillary clothing:** Outer garments auxiliary or supplemental to other protective clothing provided for fire fighters.

(5) **ANSI:** American National Standards Institute.

(6) **Apparatus:** A mobile piece of fire fighting equipment such as pumper, aerial, tanker, etc.

(7) **Approved:** A method, equipment, procedure, practice, tool, etc., which is sanctioned, consented to, confirmed or accepted as good or satisfactory for a particular purpose or use by a person or organization authorized to make such a judgment.

(8) **Bag mask:** A hand operated device consisting of a bellows type bag and a face piece used to administer artificial respiration to an individual.

(9) **Beacon:** A flashing or rotating light.

(10) **Chief:** An employer representative responsible for the fire department's operation.

(11) **City service apparatus:** An all purpose apparatus which carries ground ladders as well as forceable entry tools, salvage and overhaul equipment, and fire fighters.

(12) **Combat scene:** The site where the suppression of a fire or emergency exists.

(13) **dB(A):** A measure of noise level expressed as decibels measured on the "A" scale.

(14) **Deck pipe:** A permanently mounted device which delivers a large stream of water.

(15) **Decontamination:** A process by which hazardous substances are removed from protective clothing and equipment of personnel exposed to those substances.

(16) **Department:** Department of labor and industries.

(17) **Director of fire department:** The chief or principle administrator of the fire department.

(18) **Drill tower:** A structure which may or may not be attached to the station and which is principally used for training fire fighters in fire service techniques.

(19) **Employee:** An employee of an employer who is employed in the business of his employer whether by way of manual labor or otherwise and every person in this state who is engaged in the employment of or who is working under an independent contract the essence of which is his personal labor for an employer under this chapter whether by way of manual labor or otherwise.

(20) **Employer:** Any person, firm, corporation, partnership, business trust, legal representative, or other business entity which engages in any business, industry profession, or activity in this state and employs one or more employees or who contracts with one or more persons, the essence of which is the personal labor of such person or persons and includes the state, counties, cities,

and all municipal corporations, public corporations, political subdivisions of the state, and charitable organizations.

(21) **Employer representative:** A fire department officer authorized by the chief or director to act in his behalf.

(22) **Engine (pumper):** A piece of apparatus equipped with hose and a pump for the purpose of supplying water under pressure through hose lines.

(23) **Explosion proof:** Capable of withstanding an explosion of a specified gas or vapor which may occur within it and of preventing the ignition of a specified gas or vapor surrounding the enclosure by sparks, flashes, or explosion of the gas or vapor within, and which operates at such an external temperature that a surrounding flammable atmosphere will not be ignited thereby.

(24) **Fastest means available:** The (nearest-closest) telephone, portable radio, mobile radio, telephone/radio dispatcher or any other mode of mechanical communication.

(25) **Fire combat training:** Training received by fire fighters on the drill ground, drill tower, or industrial site to maintain the fire fighter's proficiency.

(26) **Fire fighter:** An officer or any employee who by virtue of his position in a fire department has a duty to engage in the fighting and extinguishment of fires.

(27) **Fire retardant:** A material to reduce, stop or prevent the flame spread.

(28) **Foot stand, ladder:** Devices attached to inside of beams of ladders that when folded down, provide foot space.

(29) **Fly:** Extendable sections of ground or aerial ladders.

(30) **Hazardous condition:** The physical condition or act which is causally related to accident occurrence. The hazardous condition is related directly to both the accident type and the agency of the accident.

(31) **Hazardous substances:** Substances that present an unusual risk to persons due to properties of toxicity, chemical activity, corrosivity, etiological hazards of similar properties.

(32) **HEPA filtration:** High efficiency particulate air filtration found in vacuum systems capable of filtering 0.3 micron particles with 99.97% efficiency.

(33) **Hose bed:** Portion of fire apparatus where hose is stored.

(34) **Hose tower:** A vertical enclosure where hose is hung to dry.

(35) **Industrial fire brigade:** An organized group of employees whose primary employment is other than fire fighting; who are knowledgeable, trained and skilled in the safe evacuation of employees during emergency situations, and in assisting in fire fighting operations.

(36) **Jack, ground:** Heavy jacks attached to frame of chassis of the aerial-equipped apparatus to provide stability when the aerial portion of the apparatus is used.

(37) **Ladder company:** The fire company manning an aerial ladder truck and especially trained in ladder work, ventilation, rescue, forcible entry, salvage and related tasks.

(38) Ladder pipe: A heavy stream nozzle attached to an aerial ladder usually supplied by a 3-inch hose from a Siamese intake at ground level.

(39) Life line: Length of rope to which employees and employer representatives are secured when in extremely hazardous areas.

(40) Life line gun: A gun designed to shoot a rope line, for rescue, to persons in distress such as in water, canyons, on cliffs and buildings, etc.

(41) Life net: A rescue item, commonly carried on ladder trucks, consisting of heavy canvas supported by a folding metal frame and springs and containing a pad to soften impact.

(42) Live fire training: Any fire set within a structure, tank, pipe, pan, etc., under controlled conditions to facilitate the training of fire fighters under actual fire conditions.

(43) Locking in: The act of securing oneself to a ladder by hooking a leg over a rung and placing top of foot against the other leg or against the ladder.

(44) Manned station: A fire station continuously occupied by fire fighters on scheduled work shifts. The manned station may also serve as headquarters for volunteers.

(45) MESA: Mining Enforcement and Safety Administration.

(46) Monitor: A portable device which delivers a large stream of water.

(47) NFPA: National Fire Protection Association.

(48) NIOSH: National Institute of Occupational Safety and Health.

(49) Nondestructive testing: A test to determine the characteristics or properties of a material or substance that does not involve its destruction or deterioration.

(50) Nonskid: The surface treatment that lessens the tendency of a foreign substance to reduce the coefficient of friction between opposing surfaces.

(51) Overhauling: That portion of fire extinguishment involving discovery of hidden fires or smoldering material.

(52) Outrigger: Manually or hydraulically operated metal enclosures and jacks which are extended and placed in contact with the ground to give the apparatus a wide, solid base to support different loads.

(53) Place of employment: Any premises, room or other place where an employee or employees are employed for the performance of labor or service over which the employer has the right of access or control.

(54) Platform: The portion of a telescoping or articulating boom used as an elevated working surface.

(55) Pole hole: An opening in a floor through which a pole passes and employees slide to get from one floor to another.

(56) Pompier ladder: Ladder constructed with a single spar to which a hook is attached on one end and rungs attached to the spar.

(57) Prefire training: The training of fire fighters in recognizing sources and locations of potential fires and the method of fire combat to be used.

(58) Probable fatality: An injury which by the doctor's prognosis could lead to death.

(59) Pumper (engine): An apparatus equipped with hose and a pump for the purpose of supplying water under pressure through hose lines.

(60) Qualified: One who by possession of a recognized degree, certificate or professional standing, or who by extensive knowledge, training or experience has successfully demonstrated his ability to solve or resolve problems related to the subject matter, the work or the project.

(61) RCW: Revised Code of Washington.

(62) Respiratory equipment: Self-contained breathing apparatus designed to provide the wearer with a supply of respirable atmosphere carried in or generated by the breathing apparatus. When in use, this breathing apparatus requires no intake of air or oxygen from the outside atmosphere.

(a) Respirators (closed circuit): Those types of respirators which retain exhaled air in the system and recondition such air for breathing again.

(b) Respirators (open circuit): Those types of respirators which exhaust exhaled air to the outside of the mask into the ambient air.

(c) Respirators (demand): Those types of respirators whose input air to the mask is started when a negative pressure is generated by inhalation.

(d) Respirators (pressure demand): Those types of respirators which constantly and automatically maintain a positive pressure in the mask by the introduction of air when the positive pressure is lowered (usually from .018 psi to .064 psi) through the process of inhalation or leakage from the mask.

(63) Responding: The act of answering an emergency call or other alarm.

(64) Safe and healthful working environment: The work surroundings of an employee with minimum exposure to unsafe acts and/or unsafe conditions.

(65) Safety net: A rope or nylon strap net not to exceed 6-inch mesh, stretched and suspended above ground level at the base of drill tower, and at such a height that a falling body would be arrested prior to striking the ground.

(66) Safety officer: Employer representative as assigned by chief of fire department.

(67) Scabbard: A guard which will prevent accidental injury and covers the blade and pick of an axe or other sharp instrument when worn by the fire fighter.

(68) Shall: Means mandatory.

(69) Should: Means recommended.

(70) Siamese: A hose appliance having two or more female inlets with one male outlet.

(71) Signalman: A person so positioned that he can direct an activity, such as apparatus entering or leaving a fire station, where the operator's vision is obstructed or obscured.

(72) Station (fire station): Structure in which fire service apparatus and/or personnel are housed.

(73) Tailboard: Standing space on the side or rear of an engine or pumper apparatus where fire fighters ride.

(74) Tillerman: Rear driver of tractor-trailer aerial ladder.

(75) Turnout clothing: Outer garments worn by fire fighters for personal protection consisting of helmet, gloves, coat and pants with vapor and thermal barrier liners, and boots.

(76) Turntable: The rotating surface located at the base of an aerial ladder, or boom, on aerial apparatus.

(77) Unmanned station: A station serving as headquarters for volunteer fire fighters which may or may not be attended by a chief or other officials responsible for directing the company's activities.

(78) Volunteer: Individual other than a fully paid fire fighter whose primary employment is other than fire fighting.

(79) Wheel blocks (chocks): A block or wedge placed under a wheel to prevent motion.

(80) Work environment: The surrounding conditions, influences or forces to which an employee is exposed while working.

(81) Work place: Any plant, yard, premises, room or other place where an employee or employees are employed for the performance of labor or service over which the employer has the right of access or control, and includes, but is not limited to, all work places covered by industrial insurance under Title 51 RCW, as now or hereafter amended.

[Statutory Authority: Chapter 49.17 RCW. 88-14-108 (Order 88-11), § 296-305-007, filed 7/6/88. Statutory Authority: RCW 49.17.040 and 49.17.050. 83-24-013 (Order 83-34), § 296-305-007, filed 11/30/83; Order 77-20, § 296-305-007, filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.]

**WAC 296-305-010 Variance and procedure.** Realizing that conditions may exist in operations under which certain state standards will not have practical application, the director of the department of labor and industries or his authorized representative may, pursuant to this section, RCW 49.17.080 and/or 49.17.090 and appropriate administrative rules of this state and the department of labor and industries and upon receipt of application and after adequate investigation by the department, permit a variation from these requirements when other means of providing an equivalent measure of protection are afforded. Such variation granted shall be limited to the particular case or cases covered in the application for variance and may be revoked for cause. The permit for variance shall be conspicuously posted on the premises and shall remain posted during the time it is in effect. All requests for variances from safety and health standards included in this or any other chapter of Title 296 WAC, shall be made in writing to the director of the department of labor and industries at Olympia, Washington, or his duly authorized representative, the assistant director, division of industrial safety and health, department of labor and industries, Olympia, Washington. Variance application forms may be obtained from the department upon request.

[Order 77-20, § 296-305-010, filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.]

**WAC 296-305-015 Injury and illness report for fire fighters.** (1) Notice of injury or illness;

(a) Whenever an occupational accident causes injury or illness to a fire fighter or other employee, or whenever a fire fighter or other employee becomes aware of an illness apparently caused by occupational exposure, it shall be the duty of such a fire fighter or other employee, or someone on his behalf, to report the injury or illness to the employer before the end of his duty period or not later than 24 hours. The employer shall report the accident or illness to the division of industrial safety and health, at least quarterly.

EXCEPTION: In the event that symptoms of an occupational injury or illness are not apparent at the time of the accident, the employee shall report the symptoms to his employer within 48 hours after becoming aware of the injury or illness.

(b) Whenever an injury occurs to a fire fighter or other employee while on duty and the injury results in a fatality, or probable fatality, the employer shall report the accident to the division of industrial safety and health by the fastest means available.

(2) Recordkeeping - written reports; all fire service employers shall maintain records and reports.

(3) An annual summary of the statistics tabulated in items (1) (a), (b), and (2) above shall be maintained by the department of labor and industries.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 83-24-013 (Order 83-34), § 296-305-015, filed 11/30/83; Order 77-20, § 296-305-015, filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.]

**WAC 296-305-017 Accident investigation.** (1) The affected employer, or his representative, shall assist the department in any investigation of accidents involving fire fighters or other employees of that employer.

(2) When a fatality occurs to a fire fighter while on duty, the equipment involved shall not be moved until investigated by the authority having jurisdiction except where removal is essential in preventing further accidents or is essential in the continuance of emergency action.

[Order 77-20, § 296-305-017, filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.]

**WAC 296-305-020 Accident prevention programs.** (1) The employers of fully manned fire departments shall establish safety programs with the following elements:

(a) The program shall have an assigned safety officer who is responsible for the following:

(i) Plan and direct all safety activities, work closely with the safety committee, and devise corrective measures to prevent accidents.

(ii) Be responsible for safety training of all employees.

(iii) Assist the safety committee in developing the agenda for the meeting.

(iv) See that safety recommendations are completed.

(v) Attend safety committee meetings and contribute accident prevention information and material. Where possible, assistants shall be appointed from other shifts or battalions to attend safety committee meetings.



(vi) Maintain records of accidents, injuries, inspections and other fire department safety activities.

Note: Clerical employees shall participate in the program proportionate to their degree of hazard exposure as prescribed by the safety officer.

(b) Safety committee. Each department shall have a safety committee comprised of equal employee-employer representation.

(i) The frequency of the safety committee meetings shall be determined by the employer, but shall not be less than one hour per calendar quarter.

(ii) Minutes of safety committee meetings shall be taken and transmitted to the fire department's director or his designee.

(c) Employee safety meetings.

(i) The programs shall include safety meetings, scheduled to involve all fire fighters. Different meetings may be scheduled for the fire fighters on different shifts.

(ii) The frequency of employee safety meetings shall be determined by the employer, but shall not be less than one hour per month.

(iii) Employee submitted written suggestions or complaints shall be considered. Action taken by committee shall be transmitted in writing to affected employee.

(iv) Minutes of the safety meetings shall be taken and maintained in a file for that purpose.

(v) The requirements of this subsection may be met by integrating the safety meeting into a regular training program.

(d) Inspections of manned fire stations shall be made at least monthly and records maintained to insure that stations are reasonably free of recognizable physical hazards. These inspections shall also include powered portable equipment, portable fire extinguishers, utility straps and life lines.

(2) Employers operating from unmanned or volunteer fire stations shall develop accident prevention programs that include recording injuries, scheduled safety meetings, facility and equipment inspections and a system for implementing safety recommendations from employees. These activities may be combined and performed on a schedule consistent with the other activities of the fire department.

[Order 77-20, § 296-305-020, filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.]

**WAC 296-305-025 Employer's responsibility.** (1) It shall be the responsibility of the employer to establish and supervise:

(a) A safe and healthful working environment, as it applies to non combat conditions or to combat conditions at the fire scene after fire has been extinguished, as determined by the officer in charge.

(b) An accident prevention program as required by this chapter.

(c) Programs for training employees in the fundamentals of accident prevention.

(2) The employer shall be responsible for providing suitable expertise to comply with all testing requirements in this chapter. Such expertise may be secured

from within the fire department, from equipment and apparatus manufacturers or other suitable sources.

(3) Alcoholic beverages shall not be allowed in station houses, except at those times when station houses are used as community centers.

(4) Controlled substances shall not be allowed in station houses, with the exception of those used by the profession to be administered to patients or medication prescribed by a physician, unless such prescribed medication would impair the performance of the individual.

(5) A bulletin board or posting area exclusively for safety and large enough to display the required safety poster (Form-WISHA-1) and other safety education material shall be provided. A bulletin board of "white background" and "green trim" is recommended.

(6) The employer shall develop and maintain a hazard communication program as required by WAC 296-62-054 through 296-62-05427 which will provide information to all employees relative to hazardous chemicals or substances to which they are exposed, or may become exposed, in the course of their employment.

[Statutory Authority: Chapter 49.17 RCW. 89-11-035 (Order 89-03), § 296-305-025, filed 5/15/89, effective 6/30/89; Order 77-20, § 296-305-025, filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.]

**WAC 296-305-030 Employee's responsibility.** (1) Fire fighters shall cooperate with the employer and other employees in efforts to eliminate accidents.

(2) Each fire fighter or other employee shall comply with the provisions of this chapter which are applicable to his own actions and conduct in the course of his employment.

(3) Fire fighters and other employees shall notify the appropriate employer representative of unsafe work practices and of unsafe conditions of equipment apparatus or work places.

(4) Fire fighters and other employees shall apply the principles of accident prevention in their work. They shall use all required safety devices and protective equipment.

(5) Each fire fighter shall take proper care of all personal protective equipment.

(6) Fire fighters shall attend, when on duty, required training and/or orientation programs designed to increase their competency in occupational safety and health.

(7) Fire fighters and other employees shall not report to work under the influence of alcohol or controlled substances, with the exception of medications prescribed by a physician. These prescribed medications must not impair the performance of the individual.

[Order 77-20, § 296-305-030, filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.]

**WAC 296-305-035 Safe place standards.** (1) Every employer shall furnish and require the use of appropriate safety devices and safeguards. All firefighting methods, and operations shall be so designed as to promote the safety and health of employees. The employer shall do



everything reasonably necessary to protect the lives and safety of employees.

(2) No fire fighter or other employee, employer or employer representative shall:

(a) Remove, displace, damage, destroy or carry off any safety device, safeguard, notice or warning furnished for use in any employment or place of employment.

(b) Interfere in any way with the use of any safety device, method or process adopted for the protection of any employee.

[Order 77-20, § 296-305-035, filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.]

**WAC 296-305-040 First-aid training and certification.** (1) All fully paid fire fighters and volunteers, except directors of fire departments and the directors' designated personnel, shall have first-aid training as evidenced by a current, valid first-aid card as issued by an organization approved by the director of the department of labor and industries or by documented evidence of equivalent training. New fire fighters shall have or be enrolled in such first-aid training within 90 days of the date of their employment or enroll for training within 30 days of the date of their employment.

(2) First-aid training and certification for other employees and directors of fire departments shall conform to the requirements of WAC 296-24-060.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 83-24-013 (Order 83-34), § 296-305-040, filed 11/30/83; Order 77-20, § 296-305-040, filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.]

**WAC 296-305-045 First-aid kits.** (1) There shall be present at each fire scene or other emergency response location, a first-aid kit of packaged supplies, including at least the following items:

- 1 - Bag-mask or equivalent
- 2 - Rolls of 3" bandages
- 4 - Combination pads
- 4 - Packaged 4" x 4" dressings
- 3 - Rolls of 1" adhesive tape
- 1 - Eye dressing (1 per package)

(2) All station houses while manned by employees shall maintain a first-aid kit of packaged supplies containing at least the following items:

- 4 each - 4" bandage compresses
- 4 each - 2" bandage compresses
- 5 each - Triangular bandages
- 2 each - Gauze dressings
- 2 each - Wire splints or equivalent
- 1 pair - Bandage shears
- 1 pair - Tweezers
- 1 package - Assorted adhesive bandages
- 1 package - Eye dressing (1 per package)

[Order 77-20, § 296-305-045, filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.]

**WAC 296-305-060 Personal protective equipment and clothing.** (1) Employers shall provide and maintain

at no cost to the employee and assure the use of all protective clothing and equipment required by this standard. When the employer has agreed to provide funds in lieu of the actual clothing and equipment, funding shall be adequate to allow the purchase of such clothes and equipment without cost to the employee. The employer shall assure that the protective clothing ordered or purchased after the effective date of this standard meets the requirements of this standard. Four years after this effective date the employer shall assure that all fire fighters wear protective clothing meeting the requirements of this standard when performing interior structural fire fighting. Wearing anything less than full protective clothing may be allowed by the employer's written policy as set forth in (3)(d) of this section.

(2) Personal protective equipment and clothing shall be of a type approved by NIOSH, MESA, NFPA, or as required by this section.

(3) Every fire fighter when working upon fire extinguishment on the emergency fire ground or training fire, shall wear a complete set of equipment and clothing, except when combating grass or wildland fires. Provided, clothing worn in place of full turnouts when fighting grass or wildland fires should comply with the following performance standard:

(a) Ancillary clothing.

(i) Flame resistance: When tested in accordance with Federal Test 191, Method 5903.2 "Flame Resistance of Cloth, Vertical" (standard small scale test), the test results shall not exceed the following limits:

- (A) 2.0 seconds after flame
- (B) 4.0 seconds after glow
- (C) 6.0 inches average char length or 4.0 inches

Ignition of the material shall not produce any melting and dripping of molten or flaming material. It is specifically required that upon exposure to flaming ignition or intense heat, the material will not adhere to the skin of the wearer so as to cause serious skin burns.

Exception: Ancillary clothing of 100% wool, with a weight of at least 14 ounces per lineal yard of 54-inch width shall be considered to be flame resistant.

(ii) Laundering: Garments shall be capable of withstanding not less than 50 washings or 25 dry cleanings with no significant changes in fire retardancy.

(iii) A label must be permanently attached, and shall attest that the fabric has been tested and meets the requirements of this section. The label shall include:

- (A) Lot number
- (B) The name and number of the specified test
- (C) The date of the successful test.

(b) all turnout clothing placed into service after the effective date of these regulations shall meet the requirements set forth in this standard.

(c) Ancillary clothing placed into service after the effective date of these regulations shall meet the requirements set forth in this standard.

(d) The use of ancillary clothing does not exclude each employee from having a full set of turnouts. A written policy and procedure specifying the conditions under which less than a complete set of personal protective equipment and clothing can be worn, such as grass

or wildland fires, shall be established by each employer and distributed to both fully paid and volunteer fire fighters.

(4) Written procedures with regard to repair, maintenance and servicing shall be established for the conservation of personal protective equipment. This provision applies to the fire fighter's personally owned equipment as well as to the employer owned equipment.

(5) Fire fighters shall wear the personal protective clothing and equipment designated for the task.

(6) Turnout clothing as defined in WAC 296-305-007.

(a) New turnout clothing purchased thirty days after the effective date of this chapter shall be manufactured and labeled to comply with the specifications of this chapter and NFPA Standard 1971, 1986 edition, "Protective Clothing for Structural Fire Fighting."

(b) All turnout clothing used by full-time fire department personnel after January 1, 1989, shall be at least equivalent to the specifications of this chapter and NFPA Standard 1971, 1981 edition.

(c) All turnout clothing used by volunteer fire department personnel after January 1, 1991, shall be at least equivalent to the specifications of this chapter and NFPA Standard 1971, 1981 edition.

(7) Inspection and maintenance.

(a) All turnout clothing shall be inspected by qualified personnel at not less than one hundred eighty day intervals.

(b) Turnout clothing shall be maintained as required by the manufacturer.

(8) Turnout clothing which is damaged or does not comply with this section shall not be used.

[Statutory Authority: Chapter 49.17 RCW. 88-14-108 (Order 88-11), § 296-305-060, filed 7/6/88. Statutory Authority: RCW 49.17.040 and 49.17.050. 83-24-013 (Order 83-34), § 296-305-060, filed 11/30/83; Order 77-20, § 296-305-060, filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.]

**WAC 296-305-06001 Eye and face protection.** Eye and face protection worn by fire fighters at the fire ground shall comply with the following regulations.

(1) General requirements. Face protection shall be required where there is a reasonable probability of injury that can be prevented by such protection, when such face protection does not protect the eyes from foreign objects additional eye protection shall be provided.

(2) When self-contained respiratory equipment is being utilized by fire fighters, additional eye and face protection will not be required.

Employers shall make conveniently available a type of protection suitable for the work to be performed, and employees shall use such protectors. Protectors shall meet the following minimum requirements:

(a) Provide adequate protection against the particular hazards for which they are designed.

(b) Be reasonably comfortable when worn under the designated conditions.

(c) Be durable.

(d) Capable of being disinfected.

(e) Easily cleanable.

(f) Protectors that can be worn over corrective lenses shall be available for those who need them.

(3) Face shields.

(a) Face shields shall accommodate any of the following styles of windows:

(i) Clear transparent.

(ii) Colored transparent.

(b) Disinfection. When a person is assigned protective equipment, it is recommended that this equipment be cleaned and disinfected regularly.

(c) Face shields must be an integral part of the fire helmet and may be installed in a fixed position or hinged allowing adjustment of the shields.

(d) In the event breathing apparatus is being used which incorporates a face mask, the face mask will be considered an acceptable face shield.

(4) Goggles, flexible, or cushioned fitting. Goggles shall consist of a wholly flexible frame, forming a lens holder or a rigid frame with integral lens or lenses, having a separate, cushioned fitting surface on the full periphery of the facial contact area.

(a) Materials used shall be chemical-resistant, non-toxic, nonirritating and slow-burning.

(b) There shall be a positive means of support on the face, such as an adjustable headband of suitable material or other appropriate means of support to retain the frame comfortable and snugly in front of the eyes.

(5) Design, testing and use of devices for eye and face protection shall be in accordance with current ANSI Z87.1 Occupational Eye and Face Protection.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 83-24-013 (Order 83-34), § 296-305-06001, filed 11/30/83; Order 77-20, § 296-305-06001, filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.]

**WAC 296-305-06003 Hearing protection.** The hearing protection requirements of the general occupational health standards, chapter 296-62 WAC, shall be applicable whenever personnel are exposed to noise levels above the permissible limits including at the fire station, while in transit or at a fire scene.

[Statutory Authority: Chapter 49.17 RCW. 88-14-108 (Order 88-11), § 296-305-06003, filed 7/6/88. Statutory Authority: RCW 49.17.040 and 49.17.050. 83-24-013 (Order 83-34), § 296-305-06003, filed 11/30/83; Order 77-20, § 296-305-06003, filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.]

**WAC 296-305-06005 Hand protection.** Any gloves purchased after the effective date of these standards shall meet the following criteria:

(1) Hand and wrist protection at the fire combat scene and during overhaul work shall consist of gloves or a glove system which complies with the requirements of this section.

(2) Gloves purchased after January 1, 1989, shall comply with NFPA Standard, 1973, 1983 edition.

(3) Gloves used after January 1, 1991, shall comply with NFPA Standard 1973, 1983 edition.

(4) Gloves used between January 1, 1989, and January 1, 1991, may comply with either NFPA Standard 1973, 1983 edition, or the 1976 NIOSH criteria document, Volume II: Glove Criteria and Test Methods.

(5) Fire fighters engaged in activities creating hazardous exposures to electricity shall wear approved hand protection.

(a) Electrical rubber gloves guaranteed by the manufacturer to pass a minimum dielectric test of 10,000 volts shall be worn.

(b) Rubber gloves shall be numbered and records kept for test purposes.

(c) Rubber gloves shall be tested by the following maximum retesting schedule:

	Natural Rubber (Months)	Synthetic Rubber (Months)
Rubber Protective Gloves		
New	12	18
Reissued	9	15

After use, the rubber protective gloves shall be cleaned, sanitized, tested and restored for future use. The test after use shall consist of an air pressure test which is performed by grasping the cuff at opposite sides and twirling the glove so as to roll it up the cuff to produce air pressure within the glove. The glove shall be inspected for leaks, cuts, abrasions and thin places in the rubber. Patching or vulcanizing of rubber protective gloves is prohibited. Any rubber gloves found to be defective shall be removed from service and marked as being defective.

(d) Protector gloves must be worn at all times over electrical rubber gloves.

(e) Electrical rubber gloves, when not in use, shall be carried in a suitable bag provided and designed for that purpose.

(f) When electrical rubber gloves are transported on apparatus, a compartment or box shall be used to store the gloves. No other equipment shall be placed in this compartment or box.

[Statutory Authority: Chapter 49.17 RCW. 88-14-108 (Order 88-11), § 296-305-06005, filed 7/6/88. Statutory Authority: RCW 49.17.040 and 49.17.050. 83-24-013 (Order 83-34), § 296-305-06005, filed 11/30/83; Order 77-20, § 296-305-06005, filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.]

**WAC 296-305-06007 Foot protection.** (1) Fire fighters' footwear when worn under fire combat conditions shall meet the following criteria:

(a) Protective footwear shall be water resistant for at least five inches above the bottom of the heel. Puncture resistant and rust resistant midsole that meet the puncture resistant requirements of MII-B-2885, Specification for fire fighter's boots.

(b) Safety toe able to withstand current ANSI classification Z41.1 at time of purchase.

(c) Reinforced ladder shank in turnout boots.

(d) Sole shall provide nonskid protection.

(e) Hip high boots shall have heat resistant knee protection or equivalent in addition to above requirements. Hip high boots may be worn with ancillary clothing in lieu of turnout pants.

(2) Fire fighters' boots may be resoled but the boot upon resoling shall meet the requirements as set forth in this section.

(3) This section shall apply to volunteer fire fighters for any new equipment purchased.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 83-24-013 (Order 83-34), § 296-305-06007, filed 11/30/83; Order 77-20, § 296-305-06007, filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.]

**WAC 296-305-06009 Body protection.** (1) Body protection shall be coordinated with foot and leg protection to ensure full protection for the wearer. This shall be achieved by one of the following methods:

(a) Wearing of a fire resistive coat with fully extended hip boots meeting the requirements of WAC 296-305-06007; or

(b) Wearing of a fire resistant coat with fire resistant trousers; or

(c) Wearing of ancillary clothing as specified in WAC 296-305-060 (3)(a) of this chapter.

(2) Fire resistant coat and trousers shall be at least equivalent to the requirements of the NFPA Standard #1971, protective clothing for structural fire fighters, except that the outer shell fabric shall weigh not less than 7.5 oz/yd<sup>2</sup>.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 83-24-013 (Order 83-34), § 296-305-06009, filed 11/30/83; Order 77-20, § 296-305-06009, filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.]

**WAC 296-305-06011 Head protection.** (1) Head protection shall consist of a protective head device with chin strap. Ear flaps are optional. All protective head devices shall meet the performance, construction and testing requirements for configuration, frame and head construction, electrical insulation and visibility and reflectivity as established by the National Fire Prevention and Control Administration of the United States Department of Commerce and contained in "Model Performance Criteria for Structural Firefighters Helmets" printed August 1977.

(2) All helmets used by fire department personnel after January 1, 1991, shall be equivalent to the specifications of this chapter and NFPA 1972, 1980 edition.

(3) All helmets purchased thirty days after the adoption of this chapter shall be manufactured and labeled as complying with the specifications of this chapter and NFPA 1972, 1987 edition.

(a) Helmets shall be maintained in accordance with the manufacturers recommendations.

(b) Helmets which are damaged or do not comply with this section shall not be used.

[Statutory Authority: Chapter 49.17 RCW. 88-14-108 (Order 88-11), § 296-305-06011, filed 7/6/88. Statutory Authority: RCW 49.17.040 and 49.17.050. 83-24-013 (Order 83-34), § 296-305-06011, filed 11/30/83; Order 77-20, § 296-305-06011, filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.]

**WAC 296-305-063 Respiratory equipment.** (1) Approved self-contained respiratory equipment shall be available and used by all employees who enter into hazardous atmospheres. Filter canister masks are not approved.

(2) Respiratory protection equipment used in fire combat situations shall be classified as self-contained pressure demand type and shall have a minimum rating of one-half hour nominal service life.

All respirators using compressed air shall have an audible warning device which will activate when the air pressure drops below twenty percent of the rated capacity.

(3) In structural or confined space fires at least one person trained in the use of self-contained breathing equipment and equipped with such equipment shall remain free of the contaminated area in order to afford rescue potential for exposed, disabled fire fighters.

(4) The respiratory protection requirements of the Occupational health standards—Safety standards for carcinogens, chapter 296-62 WAC, shall apply. A respirator program shall be developed which includes standard operating procedures addressing the following:

(a) Respiratory equipment inspections. The step-by-step inspection procedures included in the Washington state fire service training program shall be considered the criteria for a minimum inspection procedure.

(b) Breathing air cylinder filling and testing. Only personnel trained, experienced, and knowledgeable in the equipment and procedures shall fill or test air cylinders.

(c) Respiratory equipment training.

(i) Training shall address the same subjects as those covered by the Washington state fire service training program and shall involve at least the same number of hours.

(ii) After completing such training, each fire fighter shall practice at least quarterly, for each type and manufacture of respirator available for use, the step-by-step procedure for donning the respirator and checking it for proper function.

(5) At the end of suppression activities to include fire overhaul and before returning to quarters.

(a) Fire fighters shall be decontaminated prior to removal of respirators whenever fire fighting activities result in exposure to hazardous substances.

(b) When exchanging air supply bottles during suppression or overhaul activities, reasonable precautions shall be taken to maintain an uncontaminated atmosphere to the breathing zone and facepiece supply hose.

(c) The effective date of this item shall be nine months after the effective date of this section.

[Statutory Authority: Chapter 49.17 RCW. 88-14-108 (Order 88-11), § 296-305-063, filed 7/6/88. Statutory Authority: RCW 49.17.040 and 49.17.050. 83-24-013 (Order 83-34), § 296-305-063, filed 11/30/83; Order 77-20, § 296-305-063, filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.]

**WAC 296-305-064 Fire overhaul.** (1) Training shall be provided to fire fighters and officers in order that they will be knowledgeable in the identification and handling of asbestos containing materials likely to be encountered during a fire response.

(2) During the overhaul phase officers shall identify materials likely to contain asbestos, limiting the breaching of structural materials to that which is necessary to prevent the rekindle.

[Statutory Authority: Chapter 49.17 RCW. 88-14-108 (Order 88-11), § 296-305-064, filed 7/6/88.]

**WAC 296-305-065 Requirements for fire stations.** All of WAC 296-305-065 pertains to fire stations as defined in WAC 296-305-007.

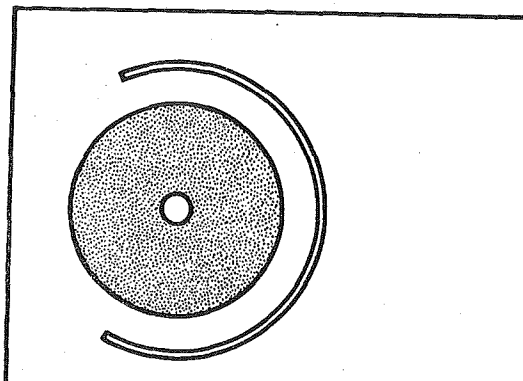
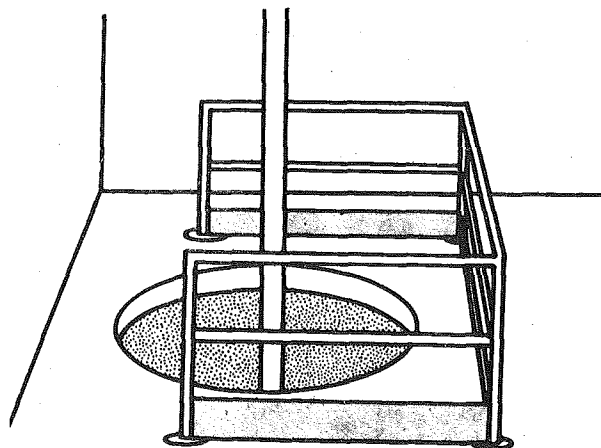
[Order 77-20, § 296-305-065, filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.]

**WAC 296-305-06501 General requirements.** (1) Every new fire station built after the effective date of this standard, whether manned or unmanned shall be equipped with an approved emergency lighting system that will light dormitories, hallways and apparatus bay areas in case of electrical power failure.

(2) Stairway tread shall be of a nonskid design. Examples of nonskid: Grip strut grating, serrated edge grating, metal grating, aluminum safety tread, abrasive metal stair tread, or pressure sensitive nonskid type.

(3) Stations and administrative offices shall comply with the requirements of WAC 296-62-09003, Lighting and illumination of the Washington state general occupational health standards.

(4) Where sliding poles are used the pole hole shall be guarded in such a manner as to prevent an employee or employer from walking directly into the pole hole opening.



(5) To absorb the shock to sliding employees, the bottom of all slide poles shall have a 3-foot diameter cushioned rubber mat, or its equivalent. The aforementioned

shall be complied with within one year of the effective date of this chapter.

(6) Nothing shall be stored or placed at the bottom of a pole hole for a radius of 3-feet from the pole. Doors shall not protrude within three feet of the pole.

(7) The requirements of WAC 296-24-145 shall be followed when employees are engaged in window washing operations.

(8) When charging batteries the vent caps shall be kept in place to avoid electrolyte spray. Care shall be taken to assure that vent caps are functioning.

(9) Smoking shall be prohibited in the battery charging area.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 83-24-013 (Order 83-34), § 296-305-06501, filed 11/30/83; Order 77-20, § 296-305-06501, filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.]

**WAC 296-305-06503 Sanitation. (1) Toilet facilities.**

**(a) General.**

(i) Except as otherwise indicated in this section, toilet rooms separate for each sex shall be provided in all places of employment in accordance with Table B-1 of this section. The number of facilities to be provided for each sex shall be based on the number of employees of that sex for whom the facilities are furnished. Where toilet rooms will be occupied by no more than one person at a time, can be locked from the inside, and contain at least one water closet, separate toilet rooms for each sex need not be provided. Where such single-occupancy rooms have more than one toilet facility, only one such facility in each toilet room shall be counted for the purpose of Table B-1.

TABLE B-1

Number of employees on duty:	Minimum number of water closets
1 to 15	1
16 to 35	2
36 to 55	3
56 to 80	4
81 to 110	5
111 to 150	6
Over 150	One additional fixture for each additional 40 employees

(A) Where toilet facilities will not be used by women, urinals may be provided instead of water closets and in such cases shall not be reduced to less than 2/3 of the minimum specified.

(ii) The requirements of item (i) of this subdivision do not apply to mobile crews or to normally unattended work locations so long as employees working at these locations have transportation immediately available to nearby toilet facilities which meet the other requirements of this section.

(iii) The sewage disposal method shall not endanger the health of employees.

(iv) Toilet paper with holder shall be provided for every water closet.

(b) Construction of toilet rooms. Each water closet shall occupy a separate compartment with a door and walls or partitions between fixtures sufficiently high to assure privacy.

**(2) Drinking water.**

(a) A common drinking cup and other common utensils are prohibited.

(b) Drinking fountain surfaces which become wet during fountain operation shall be constructed of materials impervious to water and not subject to oxidation. The nozzle of the fountain shall be at an angle and so located to prevent the return of water in the jet or bowl to the nozzle orifice. A guard shall be provided over the nozzle to prevent contact with the nozzle by the mouth or nose of persons using the drinking fountain. The drain from the bowl of the fountain shall not have a direct physical connection with a waste pipe, unless it is trapped.

**(3) Washing facilities.**

(a) General. Facilities for maintaining personal cleanliness shall be provided. These shall be convenient for the employees for whom they are provided and shall be maintained in a sanitary condition.

**(b) Lavatories.**

(i) Lavatories shall be made available in accordance with the following table.

	Number of employees on duty	Minimum number of lavatory fixtures
Nonfire-fighting personnel.	1 to 15	1
	16 to 35	2
	36 to 60	3
	61 to 90	4
Firefighters	1 to 100	1 fixture for each 10 employees

Note: In a multiple-use lavatory, 24 lineal inches of wash sink or 20 inches of a circular basin, when provided with water outlets for each space, shall be considered equivalent to one lavatory.

(ii) Each lavatory shall be provided with hot and cold running water, or tepid running water.

(iii) Hand soap or similar cleansing agents shall be provided.

(iv) Individual hand towels or sections thereof, of cloth or paper, warm air blowers or clean individual sections of continuous cloth toweling, convenient to the lavatories, shall be provided.

(v) Receptacles shall be provided for disposal of used towels.

**(c) Showers.**

(i) Except as otherwise indicated in this section, shower rooms separate for each sex shall be provided in manned stations. The number of facilities to be provided for each sex shall be based on the number of employees of that sex for whom the facilities are furnished. Where shower rooms will be occupied by no more than one person at a time and can be locked from the inside, separate shower rooms for each sex need not be provided.

(ii) One shower shall be provided for each 10 employees of each sex, or numerical fraction thereof, who are required to shower during the same shift.

(iii) Body soap or other appropriate cleansing agents convenient to the showers shall be provided as specified in this section.

(iv) Showers shall be provided with hot and cold water feeding a common discharge line.

(v) Shower floors shall be equipped with rubber mats or nonskid material.

(vi) Light switches and electrical appliances in the shower area shall be of the approved type for wet locations and shall not be located where they can be contacted by employees standing directly in water.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 83-24-013 (Order 83-34), § 296-305-06503, filed 11/30/83; Order 77-20, § 296-305-06503, filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.]

**WAC 296-305-06505 Sleeping areas.** (1) Every fire station sleeping area shall be provided with approved detectors of products of combustion other than heat conforming to Uniform Building Code Standard 43-6, mounted in the sleeping room and on the ceiling or wall at a point centrally located in the corridor or area giving access to rooms used for sleeping purposes. Where sleeping rooms are on an upper level, a detector shall be placed at the center of the ceiling directly above the stairway and at the top of the pole hole openings. All detectors shall be located within 12 inches of the ceiling. Care shall be exercised to insure that the installation will not interfere with the operating characteristics of the detector. When activated, the detector(s) shall provide an audible alarm.

(2) Smoking shall not be allowed in sleeping area after fire fighters turn-in.

(3) Dormitories for fire stations designed after December 17, 1977, shall be located in such a position that vehicular traffic adjacent to the station house does not present a hazard.

(4) The employer shall establish and implement a schedule for the cleaning of bedding.

[Statutory Authority: Chapter 49.17 RCW. 88-14-108 (Order 88-11), § 296-305-06505, filed 7/6/88. Statutory Authority: RCW 49.17.040 and 49.17.050. 83-24-013 (Order 83-34), § 296-305-06505, filed 11/30/83; Order 77-20, § 296-305-06505, filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.]

**WAC 296-305-06507 Apparatus area.** (1) Three feet of clearance shall be maintained around apparatus parked within the station where the station's width permits.

(2) Stations built after December 17, 1977, shall have a minimum of three feet of clearance around the apparatus, which shall be maintained free of any storage or obstruction.

(3) The station's apparatus floors shall be kept free of grease, oil, water and all tripping hazards. The drying of hose on the apparatus floor shall not be considered a tripping hazard.

(4) No Class I or II flammable liquids shall be used for cleaning purposes to remove grease or dirt from apparatus.

(5) Exhaust fumes from diesel or gasoline apparatus shall be emitted to the outside air. Ventilation provided by fully opened apparatus bay doors shall be considered adequate.

[Statutory Authority: Chapter 49.17 RCW. 88-14-108 (Order 88-11), § 296-305-06507, filed 7/6/88; Order 77-20, § 296-305-06507, filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.]

**WAC 296-305-06509 Refueling areas.** (1) Refueling pumps, if installed, shall be in accordance with the provisions of the Uniform Fire Code-1985.

(2) Dispensing of Class 1 liquids shall be as required in the Uniform Fire Code-1985.

(3) Fuel tanks shall not be filled while the engine is running, except during fire ground operations. Spillage should be avoided.

(4) Spillage of oil or fuel shall be carefully washed away or completely evaporated and the fuel tank cap replaced before restarting engine.

(5) Fueling areas shall be posted - "NO SMOKING-STOP YOUR MOTOR."

[Statutory Authority: Chapter 49.17 RCW. 88-14-108 (Order 88-11), § 296-305-06509, filed 7/6/88. Statutory Authority: RCW 49.17.040 and 49.17.050. 83-24-013 (Order 83-34), § 296-305-06509, filed 11/30/83; Order 77-20, § 296-305-06509, filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.]

**WAC 296-305-06511 Hose drying towers.** (1) The floor openings on hose tower platforms shall be equipped with a 42-inch guardrail with midrail and shall be capable of withstanding a force of 250 pounds applied in any direction at any point on the top rail.

(2) The toeboard requirements for elevated work platforms in hose drying towers shall not apply unless hand tools or objects other than hoses are carried onto the platforms.

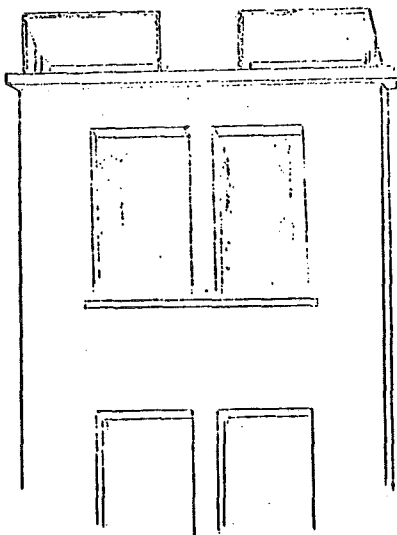
(3) The requirements for offset ladder platforms and ladder cage guards, when ladders extend beyond 30 feet, shall apply to hose drying towers.

(4) Ropes used to hoist hose in the hose towers shall have a breaking strength of 3,000 pounds for a safe load strength of 600 pounds (5 to 1 safety factor).

[Order 77-20, § 296-305-06511, filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.]

**WAC 296-305-06513 Drill towers.** (1) Permanent fixed ladders on the outside of drill towers and drill buildings are exempt from the requirements of offset platform landings and ladder cage guards.





[Order 77-20, § 296-305-06513, filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.]

**WAC 296-305-06515 Fire station equipment and tools.** (1) Equipment and tools in maintenance and hobby shops shall be guarded as required by the guarding provisions of chapter 296-24 WAC.

(2) Exposure of fan blades. When the periphery of the blades of a fan is less than ten feet above the floor or working level, the blades shall be guarded. The guard shall have openings no larger than one-half inch.

(3) Abrasive wheels and grinders.

(a) All abrasive wheels and grinders, shall be guarded as required by WAC 296-24-18003.

(b) Abrasive wheel machinery guards shall meet the design specifications of the American National Standard Safety Code for the Use, Care and Protection of Abrasive Wheels, ANSI B7.1-1970. This requirement does not apply to natural sandstone wheels, or metal, wooden, cloth or paper discs having a layer of abrasive on the surface.

(c) Before it is mounted on the spindle, each abrasive wheel shall be given a "ring test" by the user. This test is performed by setting the unmounted wheel upright on a clean, hard floor and tapping it on the upper side with a light, nonmetallic instrument (such as screwdriver handle). A clear ringing tone indicates an undamaged wheel. A damaged, cracked wheel will emit a "dead" sound and shall be replaced.

(d) Grinding wheels shall fit freely on the spindle and remain free under all grinding conditions. The wheel hole shall be sufficiently larger than the spindle diameter to assure safety clearance under all conditions of operating heat and pressure.

(e) Before mounting, the user shall check the maximum operating speed marked on the wheel, and shall make certain that spindle speed does not exceed this maximum.

(f) All contact surfaces of wheels, blotters and flanges shall be flat and free of foreign matter.

(g) When a bushing is used in the wheel hole, it shall not exceed the width of the wheel and shall not contact the flanges.

(h) Work rests on bench mounted abrasive wheel grinders shall be used to support the work. These shall be of rigid construction and designed to be adjustable to compensate for wheel wear. Work rests shall be kept adjusted sufficiently close to the wheel with a maximum opening of one-eighth inch to prevent the work from being jammed between the wheel and the rest. Adjustment of the work rest shall not be made while the wheel is turning.

(i) Goggles or face shields shall be used when grinding.

(j) Abrasive and composition blades shall be stored and protected against exposure to fuel and oil.

[Order 77-20, § 296-305-06515, filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.]

**WAC 296-305-06517 Stair and landing protection.**

(1) Stairway railings and handrails. Every flight of stairs having four or more risers shall be equipped with standard stair railings or standard handrails as follows:

(a) On stairways less than 44-inches wide having both sides enclosed, at least one handrail, preferably on the right side descending.

(b) On stairways less than 44-inches wide having one side open, at least one stair railing on open side.

(c) On stairways less than 44-inches wide having both sides open, one stair railing on each side.

(d) On stairways more than 44-inches wide but less than 88-inches wide, one handrail on each enclosed side and one stair railing on each open side.

(e) On stairways 88 or more inches wide, one handrail on each enclosed side, one stair railing on each open side, and one intermediate stair railing located approximately midway of the width.

(2) A standard guard railing shall consist of top rail, intermediate rail, and posts, and shall have a vertical height of 36 to 42 inches from upper surface of top rail to floor, platform, runway, or ramp level. The top rail shall be smooth-surfaced throughout the length of the railing. The intermediate rail shall be approximately halfway between the top rail and the floor, platform, runway, or ramp. The ends of the rails shall not overhang the terminal posts except where such overhang does not constitute a projection hazard.

(3) A standard guard railing for a landing platform shall include a toeboard which is a vertical barrier at floor level erected along exposed edges of a floor opening, wall opening, platform, runway or ramp to prevent falls of material.

(4) A stair railing shall be of construction similar to a standard railing but the vertical height shall be not more than 34 inches nor less than 30 inches from upper surface of top rail to surface of tread in line with face of riser at forward edge of tread.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 83-24-013 (Order 83-34), § 296-305-06517, filed 11/30/83; Order 77-20, § 296-305-06517, filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.]



**WAC 296-305-070 Automotive fire apparatus.** All of WAC 296-305-070 pertains to fire apparatus as defined in WAC 296-305-007.

[Order 77-20, § 296-305-070, filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.]

**WAC 296-305-07001 Design and construction.** (1) All fire apparatus with the exception of specialized equipment, shall conform to the minimum safety standards contained in N.F.P.A. Booklet No. 1901.

(2) Fire apparatus, purchased after December 17, 1977, weighing 10,000 pounds or more shall conform with the following department of transportation standards, when applicable:

(a) 571-121 Standard 121, Air brake systems;

(b) 571-106 Standard 106, Hydraulic brake hoses;

(c) 571-211 Standard 211, Wheel nuts, wheel discs, hub caps.

(3) Employers purchasing used fire apparatus or used military equipment shall not be required to bring them under a more stringent code than the one in force at the time the apparatus was manufactured. The exception to this rule would be seat belts and communication systems between the tailboard or tiller's seat and driver compartment as stipulated in WAC 296-305-07003(2), 296-305-07007(1), 296-305-105 (5)(a) and (b), and 296-305-110(4).

(4) Where practicable for the intended application and use, new apparatus purchased after December 17, 1977, shall have covered crew cabs.

(5) Fire apparatus tailboards and steps leading to the cab shall have a nonskid rough surface.

(6) Shields shall be provided for individuals who ride the side of city service apparatus to protect them from flying debris and weather.

(7) Exhaust systems shall be installed and maintained in proper condition, and shall be so designed as to eliminate the exposure of the fire fighter to the exhaust gases and fumes.

(8) Spinner knobs shall not be attached to steering handwheels of fire apparatus.

(9) The transmission shifting pattern of the apparatus shall be clearly stenciled or labeled and posted so it can be clearly read by the driver while operating the apparatus.

(10) The height of the apparatus from the ground to the top of the beacon or highest point of apparatus shall be clearly labeled in a place where it can be easily and clearly read by the driver while operating the apparatus.

[Statutory Authority: Chapter 49.17 RCW. 88-14-108 (Order 88-11), § 296-305-07001, filed 7/6/88. Statutory Authority: RCW 49-17.040 and 49.17.050. 83-24-013 (Order 83-34), § 296-305-07001, filed 11/30/83; Order 77-20, § 296-305-07001, filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.]

**WAC 296-305-07003 Automotive fire apparatus equipment.** (1) Vehicles used to transport fire fighter and employer representatives shall have compartments for carrying sharp tools, saws, chisels, axes, etc., or if carried on the outside of the apparatus, sharp points and edges shall be covered to prevent injury to fire fighters and employer representatives.

(2) Personnel restraints for traveling.

(a) All personnel shall ride in a seated position if adequate seats are available.

(b) While in transit, all operators and passengers shall be protected from accidental displacement out of or off the apparatus. Means of restraint may include but are not limited to:

(i) For seated passengers, correct use of at least a pelvic seatbelt. Seatbelts shall comply with Part 49 CFR Section 571, Standards 209 and 210, U.S. DOT Regulations;

(ii) For tailboard passengers, containment within a guardrail enclosure or correct use of a safety belt and short lanyard securely connected to the apparatus;

(iii) Safety belt lanyards shall be secured to an anchorage or structural member capable of supporting a minimum dead weight of 5400 pounds.

(c) Safety belts shall be constructed and maintained in compliance with ANSI A10.14-1975.

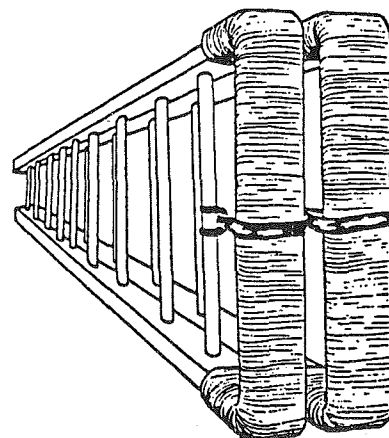
(d) Lanyards shall be a minimum of one-half inch nylon or equivalent with a nominal breaking strength of 5400 pounds.

(e) Minimum structural members for tailboard enclosures shall be two-inch diameter standard schedule 40 pipe or the equivalent. The enclosure shall be constructed to a minimum top rail height of forty-two inches and shall include a midrail and a toeboard at least four inches high. Access door(s) shall be constructed and mounted to achieve structural integrity comparable to the remainder of the enclosure. The door(s) latch shall be equivalent to a one-quarter inch by two-inch solid steel bar.

(3) Each fire apparatus shall carry a United States Department of Transportation chemical identification book or the equivalent.

(4) Ladders stowed on the sides of apparatus, which protrude into a passage area of a fire station, shall have guards over the butt ends. This guard can be in the form of a short piece of 2-1/2 inch hose.

(5) No employer shall permit automotive fire apparatus equipment which has an obstructed view to the rear to be used in reverse gear unless the equipment has in operation a reverse signal alarm distinguishable from the surrounding noise level.



[Statutory Authority: Chapter 49.17 RCW. 88-14-108 (Order 88-11), § 296-305-07003, filed 7/6/88. Statutory Authority: RCW 49.17.040 and 49.17.050. 83-24-013 (Order 83-34), § 296-305-07003, filed 11/30/83; Order 77-20, § 296-305-07003, filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.]

**WAC 296-305-07005 Apparatus operational rules.**

(1) Each employer of fully manned stations shall establish a written policy and procedure whereby the apparatus has a scheduled daily maintenance check. Each employer of an unmanned or volunteer station shall establish a schedule appropriate to that department's activities.

(2) Any item found to be in need of repair shall be reported immediately to his supervisor.

(3) Fire fighting apparatus shall be brought to a full stop when employees are required to step from the apparatus.

(4) Fire fighters shall ride in crew cabs when available.

(5) Fire fighters shall not be in the apparatus hose bed while hose is being run out from the bed.

(6) Headlights shall be on at all times when any fire or emergency vehicle is responding to a call.

(7) Whenever an apparatus is parked at a fire scene, wheel blocks shall be utilized.

(8) Apparatus responding to alarms shall meet specifications in RCW 46.61.035, relating to operations of authorized emergency vehicles.

(9) All operators of emergency vehicles shall be trained in the operation of their assigned apparatus before they are designated as drivers of such apparatus. The training program shall be established by each fire department.

(10) Stunt driving and horseplay shall not be allowed.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 83-24-013 (Order 83-34), § 296-305-07005, filed 11/30/83; Order 77-20, § 296-305-07005, filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.]

**WAC 296-305-07007 Apparatus operation communications.**

(1) When fire fighters are required to ride on the tailboard, or tiller's seat, an electrical signal or voice communication system shall be installed between tailboard or tiller's seat and driver compartment. The following set of signals shall be used for communication between the driver and a tillerman, or between the driver and fire fighters riding the tailboard:

- (a) One long buzz means stop;
- (b) Two buzzes means forward;
- (c) Three buzzes means reverse.

Before any of the above functions are undertaken, with the exception of stopping, the same appropriate signal

must be received from the tailboard. Example: If driver is responding to an alarm before starting out, two beeps on the horn will be sounded. Driver will not advance, however, until the same signal is sounded from the tailboard or tillerman.

(2) When using hand signals, these signals are as follows:

**STOP**

Hold hands to the side, shoulder high, exposing palms to driver. At night, hold hands in the same manner, with the addition of a flashlight in one hand, shining at the driver. This will indicate an immediate STOP.



**RIGHT OR LEFT**

Point in the desired direction with one hand and motion in a circular "come on" gesture with the other at chest level. At night, direct a flashlight beam at the hand pointing in the desired direction.

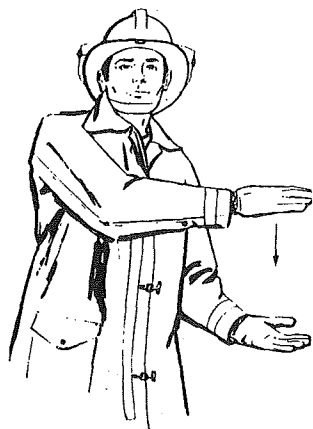


**AHEAD OR BACK UP**

Hold hands directly in front, chest high, fingers on hands directed toward one another, and motion in a circular "come on" gesture. At night, hold a flashlight in one hand and direct the beam toward the other.

**DIMINISHING CLEARANCE**

Hold the hands to one side of the body indicating the approximate amount of distance the apparatus is from the obstacle. Close hands accordingly as the driver slowly maneuvers his apparatus toward same. Close hands as the distance narrows to a point where the signalman indicates immediate STOP. Always allow enough for driver's reaction time. At night, indicate in the same manner with a flashlight in the upper hand and beam directed at the palm of the other. On STOP, cover the flashlight beam with the hands.



[Statutory Authority: RCW 49.17.040 and 49.17.050, 83-24-013 (Order 83-34), § 296-305-07007, filed 11/30/83; Order 77-20, § 296-305-07007, filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.]

**WAC 296-305-07009 Maintenance and repair.** (1) If at any time, a fire apparatus is found to be in an unsafe condition, it shall be reported to the supervising officer on duty and, if in his opinion, the apparatus cannot be used in a safe manner, it shall be taken out of service until it has been restored to a safe operating condition.

[Title 296 WAC—p 2196]

(2) All repairs made to fire department apparatus shall only be made by personnel authorized by the employer.

(3) Tires on fire service apparatus shall be changed when the tread depth reaches 4/32 of an inch, measured in any two major tread grooves at three locations equally spaced around the circumference of the tire.

[Order 77-20, § 296-305-07009, filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.]

**WAC 296-305-075 Fire service equipment.** (1) Before using portable equipment, the user shall inspect it to determine to his satisfaction that it is operable.

(2) When equipment develops a defect which would result in a hazard to the fire fighter, it shall immediately cease to be used.

(3) Nylon utility straps or straps of equivalent strength should be used instead of hose belts. The utility strap shall be of 1 inch nylon, or equivalent belting, with a 4-inch overlap and sewn with polyester thread and shall measure at least 102 inches outside circumference.

(4) The load capacity of each portable jack shall be stenciled on each portable jack and shall not be exceeded.

(5) The instruction plate on portable jacks shall be maintained in a legible condition.

(6) When not in use the cutting teeth on a chain saw shall be covered either by an old section of hose, a wooden scabbard, or an equivalent method.

(7) All axes worn by employees shall be provided with a scabbard to guard against injury from the blade and pick of the axe.

(8) The guards on smoke ejectors as supplied by the manufacturer shall not be removed and the operator of the ejector shall wear gloves.

(9) Acetylene cylinders. Handling, storage and utilization of acetylene in cylinders shall be in accordance with Compressed Gas Association Pamphlet G-1-1966.

(10) Fiber rope that has been subjected to injurious chemicals or excessive heat shall not be used for load carrying purposes.

(11) In using formed-charge, explosive devices for forceable entry or ventilation, prescribed safety measures as stipulated by the manufacturer shall be followed.

(12) Each employer using formed-charge, explosive devices shall establish and use a procedure by which employees and the general public are notified and protected when explosive devices are to be fired.

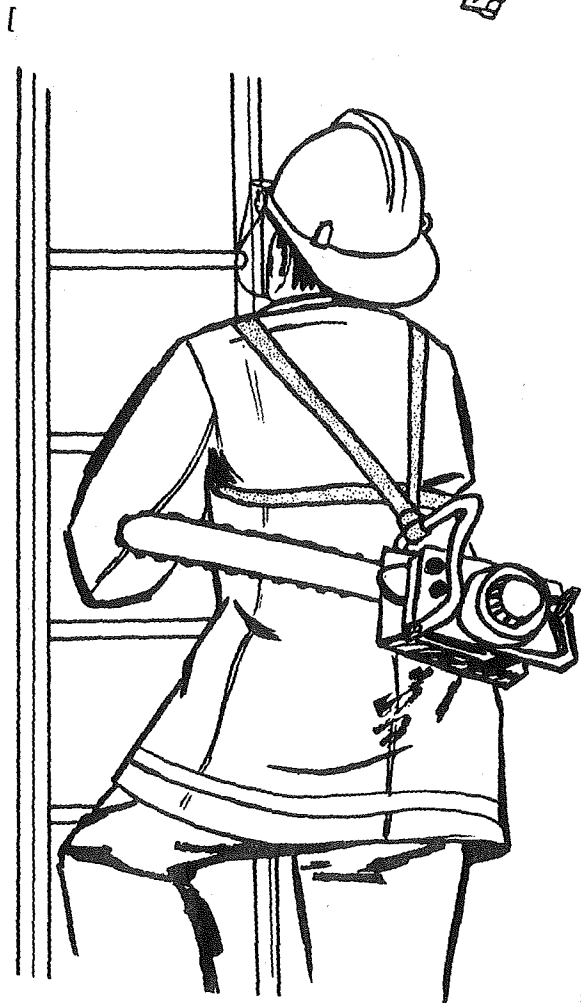
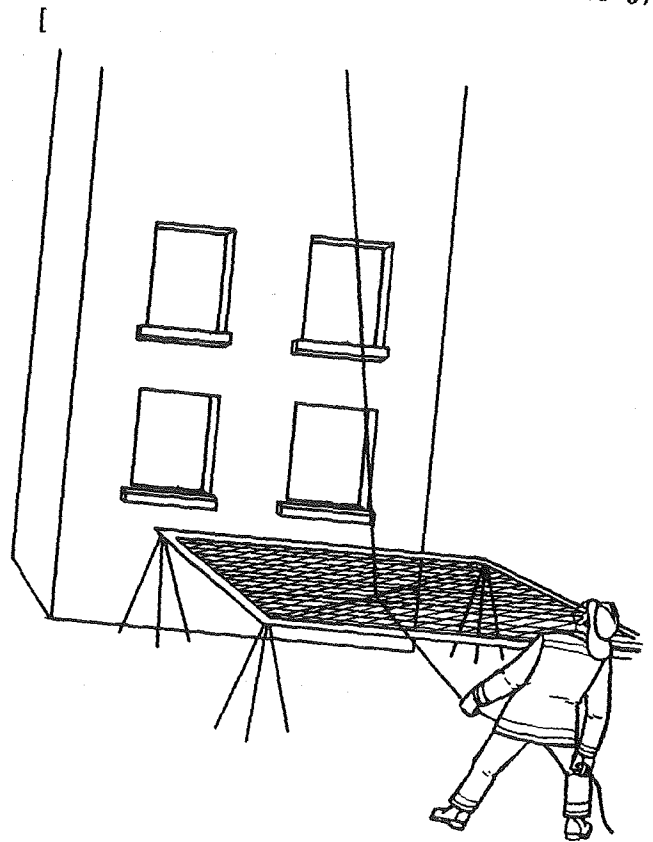
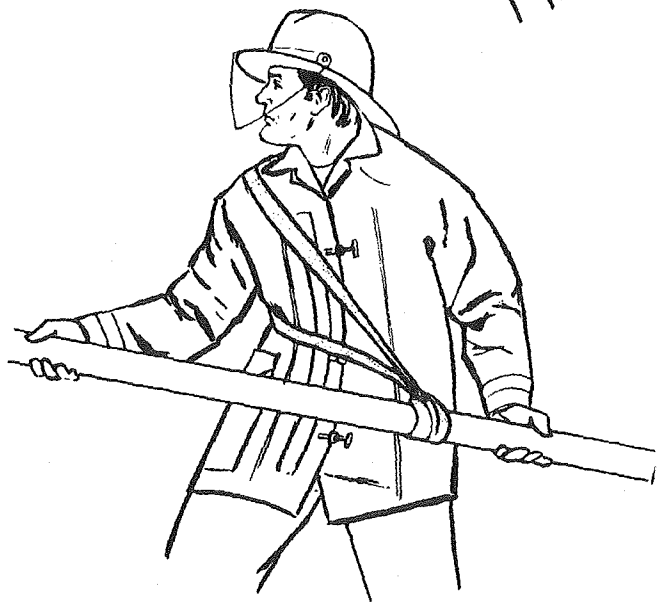
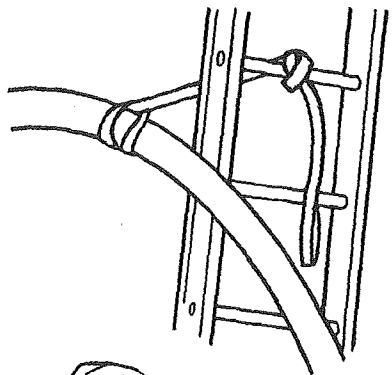
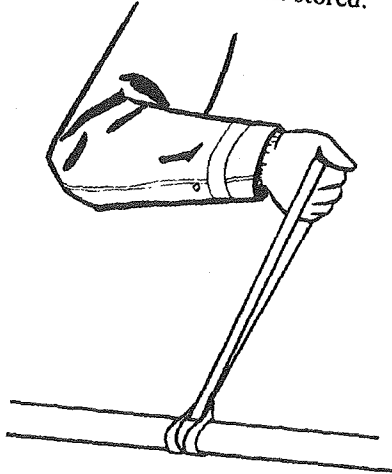
(13) Formed-charge, explosive devices shall not be used in an explosive or flammable atmosphere.

(14) A storage container shall be furnished for the formed-charge device and the container labeled "EXPLOSIVE."

The shipping container shall suffice as a storage container when labeled "EXPLOSIVE."

(15) Powder activated life-line guns and accessories shall be stored in a box or container equipped with a lid or cover. When not in use the box shall be kept closed. A loaded life-line gun shall not be placed in the storage box.

- (16) Instruction books, cleaning kits and hand tools needed for maintenance or breakdown purposes shall be kept in the life-line-gun storage box.
- (17) The words "powder activated tool" shall be conspicuously printed on the top of the storage box.
- (18) Portable abrasive saws shall have the upper half of the abrasive wheel guarded.
- (19) Abrasive blades shall be protected from contact with oil, water, and liquids when stored.



[Statutory Authority: RCW 49.17.040 and 49.17.050. 83-24-013 (Order 83-34), § 296-305-075, filed 11/30/83; Order 77-20, § 296-305-075, filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.]

Reviser's note: RCW 34.05.395 requires the use of underlining and deletion marks to indicate amendments to existing rules, and deems ineffectual changes not filed by the agency in this manner. The bracketed illustrations in the above section do not appear to conform to the statutory requirement.

#### WAC 296-305-080 Testing fire service equipment.

(1) When testing fire hose, a restricted orifice disc, having not more than a 25% opening, shall be installed on the pumper discharge port, or in the alternative the pumper discharge valve may be opened not more than 25%, to insure a minimum volume of water in case of a bursting hose.

(2) Safety nets shall be tested annually by dropping a weight of not less than 160 pounds from the highest point to be used above the net. The test weight object may consist of two tightly tied rolls of 2-1/2 inch hose, each 100 feet long or any other object having similar weight and dimension.

(a) The net suspension system shall be designed and constructed with a safety factor of four and as a minimum shall withstand the test loading without permitting contact between the net and any surface or object below the net.

(b) Forged steel safety hooks or shackles shall be used to fasten the net to its supports.

(c) Training requiring safety net protection shall not be undertaken until the net is in place and has been tested by the weight of three fire fighters on the net.

(d) Safety nets shall extend 8 feet beyond the edge of the work surface.

(e) The mesh size of nets shall not exceed six inches by six inches.

(f) All nets shall meet accepted performance standards of 17,500 foot pounds minimum impact resistance as determined and certified by the manufacturer, and shall bear a label of proof test.

(g) Edge ropes shall provide a minimum breaking strength of 5,000 pounds.

(3) Life belts shall meet the strength requirements of ANSI A10.14 Requirements for Safety Belts, Harnesses, Lanyards, Lifelines and Drop Lines for Industrial Use. Life belts shall be inspected after each use and not less than semi-annually in accordance with manufacturer's instructions.

(4) Rescue ropes shall be used for rescue purposes only.

(5) Rescue ropes shall meet the following requirements:

(a) Shall be constructed of rot-proof fiber with a melting point of not less than 400 degrees F;

(b) Shall be of abrasion resistant construction;

(c) Shall have a minimum breaking strength of not less than 9,000 pounds; and

(d) Shall have a breaking elongation of not less than twenty percent.

(6) Rescue ropes shall be padded when deployed over edges or rough surfaces.

[Title 296 WAC—p 2198]

(7) Rescue ropes shall be inspected after each use and not less than semi-annually in accordance with manufacturer's instructions.

(8) The method of testing a life line gun shall be in accordance with the manufacturer's recommended procedure.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 83-24-013 (Order 83-34), § 296-305-080, filed 11/30/83; Order 77-20, § 296-305-080, filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.]

#### WAC 296-305-085 Fire combat training. (1) Each employer shall establish and follow a policy and procedure for drills and training so that fire fighters can remain proficient in the use of the fire department's equipment.

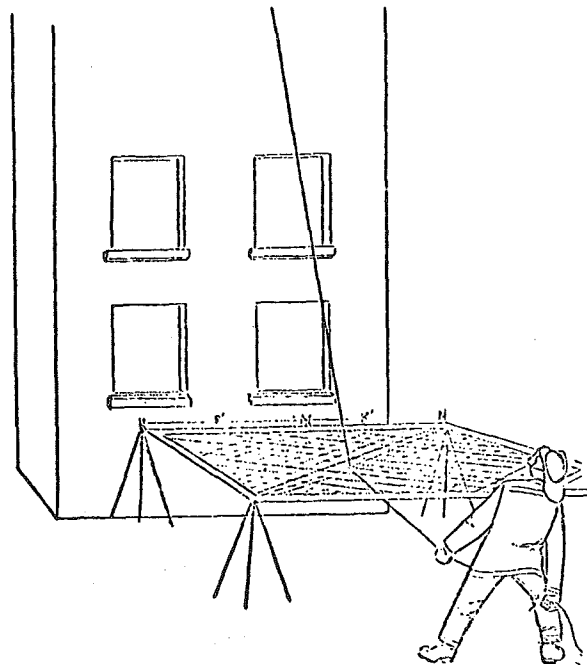
(2) Live fire training activities shall be conducted under the direction of the fire department training officer or by state fire service certified instructors who are qualified experts for fighting the specific type of fire.

(3) Gloves, helmets, boots or safety toe shoes shall be worn while training with ladders, appliances or hose.

(4) When fire fighters are engaged in training above the ten foot level at a drill tower where use of life lines, pompier ladders or similar activities are to be undertaken, a safety net shall be erected.

(5) When fire fighters are sliding the life line, the life line shall pass through the center of the net and shall be attended by a fire fighter.

(6) During wet training exercises, only fire hose meeting the 250 pound annual test shall be used.



[Order 77-20, § 296-305-085, filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.]

#### WAC 296-305-090 Operations. (1) Special procedures to be used in the case of fires involving known hazardous materials shall be prepared in advance and made available to all fire fighters.

(1989 Ed.)

(2) Each fire department shall develop a set of tactical operating procedures to be used as guidelines for fire fighting operations including operating procedures for the use of life lines.

(3) Every fire department shall possess a means for identifying the specific hazards associated with fires involving hazardous materials.

(4) In cases where radioactive material is involved either through accidents, contamination or other related problems, the nearest United States Nuclear Regulatory Commission Field Inspection Unit or the Hanford Atomic Works shall be notified for information or help in disposing of the problem.

(5) When opening or closing hydrants, fire fighters shall stand at the rear of the hydrant whenever possible.

(6) If a fire fighter disappears from the fire ground, it shall be immediately reported to an officer at the scene who will then cause additional search or rescue operations.

(7) A life line gun shall be used according to the instructions along with the correct shield, guard, or attachment as recommended by the manufacturer.

(a) Life line guns shall not be loaded until just prior to the intended firing time.

(b) Neither loaded nor empty life line guns are to be pointed at any individual.

(c) A loaded life line gun shall not be left unattended.

(8) Traffic cones or other traffic control devices shall be utilized when vehicular traffic hazards exist at the fire scene.

(9) Scuba diving operations shall comply with the provisions of WISHA Commercial Diving Operations.

(10) Portable generators for temporary lighting at fire scenes shall be grounded, where practicable.

(11) Temporary cords to light fixtures shall be strung overhead where practical or against the walls of the room so as not to cause a tripping accident.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 83-24-013 (Order 83-34), § 296-305-090, filed 11/30/83; Order 77-20, § 296-305-090, filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.]

**WAC 296-305-095 Fire overhaul.** (1) Prior to overhaul, buildings shall be surveyed for possible safety hazards. Fire fighters shall be informed of hazards observed during survey.

(2) Once a fire involving a building which has been previously marked as unsafe by city, county or state inspectors has been extinguished, the overhaul operations shall be held to a minimum, as determined by the commanding officer.

[Order 77-20, § 296-305-095, filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.]

**WAC 296-305-100 Ladders.** This section establishes the minimum requirements for the construction, care and use of the common types of ladders used in fire combat.

(1) Ladder locks or pawls on extension ladders shall be so fastened or secured to the beams that vibration and use will not cause loosening of bolts and nuts. Pawls

or ladder locks shall be so constructed that the hook portion of the pawl that engages the rung shall have sufficient bearing surface or area to prevent the hook from cutting into rungs when engaged. Such hooks shall be properly finished to eliminate sharp edges and points.

(2) Staypoles or tormenters shall be furnished on all extension ladders extending over 36 feet. Staypole or tormenters spikes shall not project beyond the end of the ladder when nested.

(3) All ladders shall be stored in a manner to provide ease of access for inspection, and to prevent danger of accident when withdrawing them for use.

(4) All ladders regardless of type must be inspected thoroughly after each use. Records shall be kept of the inspections and repairs.

(5) The following metal ladder components shall be checked:

(a) Rungs for welds, damage or weakness caused by overloading or bumping against other objects, looseness and cracks, etc.

(b) Beams for welds, rivets and bolts, signs of strain or metal fatigue, and deformation from heat or overloading.

(c) Halyards for the same defects listed for wood ladder halyards and cable halyards, for fraying or breaking.

(6) Methods of fastening ladder halyards, either of wire or fibrous material, shall be in a manner that the connection is stronger than the halyard.

(7) Any defect noted in above visual inspection shall be corrected prior to testing.

(8) Every portable ladder shall be tested following the correction of defects disclosed by the visual inspections.

(9) New ground ladders purchased after the effective date of this chapter shall be constructed and certified in accordance with the requirements of NFPA Standard 1931, 1984 edition.

(10) All fire ground ladders shall be inspected, tested, and maintained in accordance with the requirements of NFPA Standard 1932, 1984 edition. To include tentative interim amendment 1932-84-2.

Note 1: Hardness testing and eddy current NDE testing is not required in the fire department annual maintenance inspection unless the individual ladder has been subjected to a high heat exposure which could have annealed the metal and diminished the structural integrity. The ladder manufacturer's recommendations should be followed with respect to hardness and eddy current testing.

Note 2: Testing should follow the recommended procedures taught by Washington state fire service training.

[Statutory Authority: Chapter 49.17 RCW. 88-14-108 (Order 88-11), § 296-305-100, filed 7/6/88. Statutory Authority: RCW 49.17.040 and 49.17.050. 83-24-013 (Order 83-34), § 296-305-100, filed 11/30/83; Order 77-20, § 296-305-100, filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.]

**WAC 296-305-105 Aerial ladders.** (1) When operating aerial ladders, the manufacturer's suggested procedure shall be followed and the number of fire fighters permitted on aerial ladders shall be in accordance with the manufacturer's instructions.

(2) Ladders shall be designed to have nonskid protection on the rungs.

(3) Aerial ladders shall be used according to the requirements of the following:

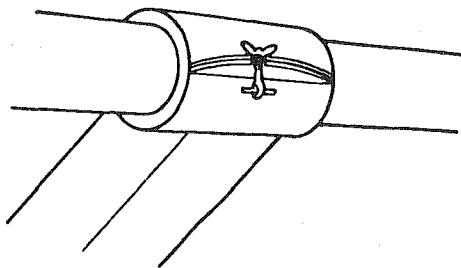
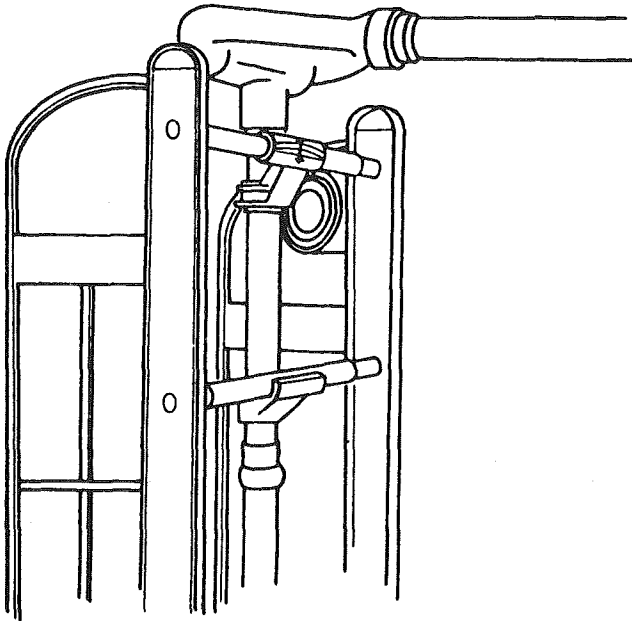
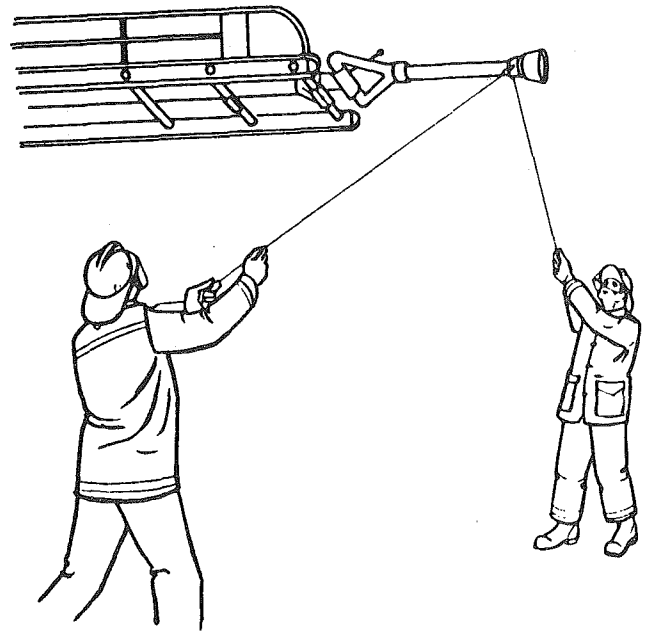
(a) Aerial ladders shall not knowingly be positioned under dangerous cornices or other loose overhanging objects that may endanger fire fighters and fire fighters working on or climbing the ladder, except where rescue operations are essential.

(b) The tip of the aerial ladder shall not be forcefully extended against a solid structure.

(c) Aerial ladders shall not be extended or retracted while fire fighters are climbing the ladder.

(d) Locking in shall not be permitted. If it is necessary for fire fighters to be positioned on the aerial, they shall be secured by a life belt.

(e) Ladder pipes, when in use, shall be secured to the aerial in such a manner so that the ladder pipe cannot be accidentally dislodged while in operation.



(4) The following shall regulate the design and use of the operating turntable:

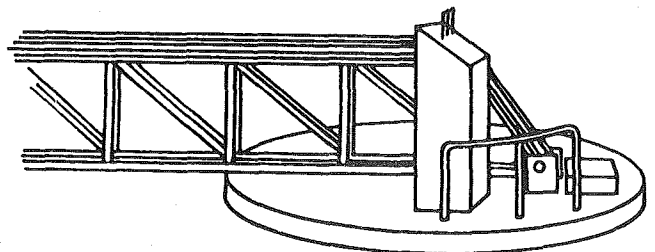
(a) Turntable controls and valves for rotating, extending, or elevating the aerial ladder shall be clearly and distinctly marked as to function.

(b) Aerial controls shall be spring loaded and have a safety catch so that the controls will return to the neutral position if the operator were incapacitated.

(c) The operator of the aerial shall be provided with a nonskid surface on the turntable surface.

(d) The aerial operator shall remain at the turntable whenever fire fighters are working on the aerial except when used as a ground ladder.

(e) A railing of approximately 44-inches in height and if possible, not less than 36-inches in length shall be installed on the turntable in back of the operator's position.



(f) A light of not less than 10,000 candlepower shall be provided at the base to illuminate the ladder at night in any position of operation.

(5) The following shall regulate the communication systems on the aerial ladders and on the automotive fire apparatus:

(a) A two-way voice communication system shall be installed between the top fly of the ladder and the lower control station.

(b) There shall be some type of electrical signal or voice communication located in the tractor of tillered



aerial for communication signals between the tillerman and driver. The apparatus shall not be moved unless the proper signal, as shown in WAC 296-305-07007(1) is received from the tillerman.

(6) Cables, pulleys, rails and rungs of aerial ladders shall be inspected for wear and tightness on a monthly basis.

(a) Pulleys on the aerial with cracks or pieces broken out of rims shall be replaced.

(b) Cables showing evidence of damage or wear shall be replaced.

(c) Rungs or rails that have been subjected to unusual impact shall be tested before usage.

(7) The automotive fire apparatus used in conjunction with aerial ladders shall be designed and used according to the following:

(a) The apparatus engine shall be able to be started from the main control panel in the event the engine dies.

(b) Ground jacks or outriggers shall be used when the aerial ladder is in operation.

(c) Ground plates shall be used under the outriggers or jacks anytime apparatus is not on a concrete paved street or alley.

(d) Hand, airbrakes and spring brakes for fifth wheel shall be set whenever aerial ladder is in operation.

(e) In addition to ground jack supports and outriggers, wheel blocks shall be used whenever the aerial is in operation.

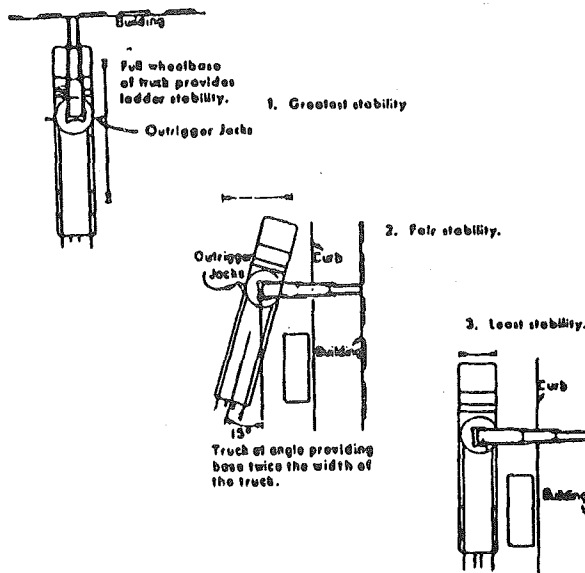
(f) Sand shall be put under jacks, outriggers and wheels when operating on ice or snow.

(8)(a) Annual testing of metal aerial ladders shall follow the recommendations of the current National Fire Code.

(b) It is recommended the aerial ladder as well as the support section of the apparatus which supports the turntable shall be nondestructively tested by a certified testing agency every five years. After any accident that causes structural damage this test shall be performed and all defects detected shall be corrected before apparatus is returned to service.

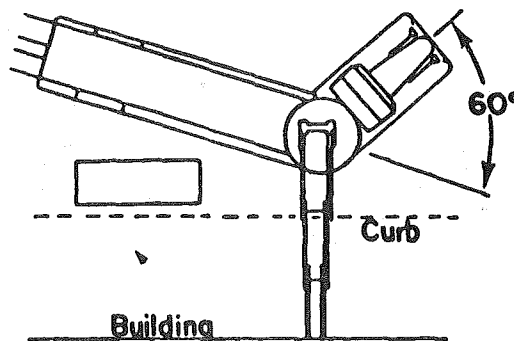
(9) Fire apparatus metal aerial ladders shall be positioned for the greatest stability feasible at the fire scene.

(10) The minimum size for wheel chocks shall be approximately 7-inches high, 8-inches wide and 15-inches long. It is suggested they be made of a metal alloy.

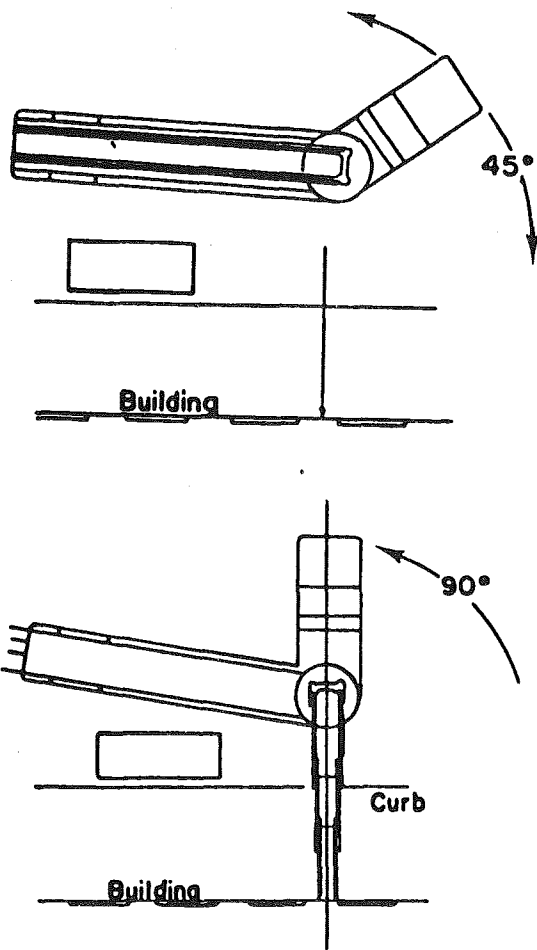


Aerial ladder operators and officers should be familiar with these relative degrees of stability obtained by spotting the truck.

Ladder raised at right angle to truck without outrigger jacks provides minimum stability.



Where width of street does not permit placing the tractor at right angles to the trailer or in line with the ladder, a 60° jackknifing should provide excellent stability without unduly blocking the street. A ladder raised away from the V formed by the curb has greater stability than a ladder raised into the V.



**Setting tractor-trailer serial for maximum stability:**

1. Approach until turntable is opposite desired objective. Then cut tractor slightly toward center of street.

2. Cut tractor wheels sharply and back up. This will push turntable slightly toward building and align tractor with point to which the ladder is to be raised.

A similar evolution can be used where the ladder is to be raised in line with the trailer where it is necessary to head in toward a building. On some trucks a warning signal is provided to guard against jacking in excess of 90° which is considered poor practice and may result in danger to the apparatus.

[Statutory Authority: RCW 49.17.040 and 49.17.050, 83-24-013 (Order 83-34), § 296-305-105, filed 11/30/83; Order 77-20, § 296-305-105, filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.]

**WAC 296-305-110 Elevated platforms.** (1) Elevated platform systems shall meet the design requirements of this section.

(a) The platform shall have a minimum floor area of 14 square feet and shall be provided with a guardrailing between 42 and 45-inches high on all sides. The railing shall be constructed so that there is no opening below it greater than 24-inches. There shall be two gates below the top railing, each of which shall be provided with suitable safety latches. A kick plate not less than 4-inches high shall be provided around the floor of the platform. Drain openings shall be provided to prevent water accumulation on the platform. A heat-protective shield shall be provided on the platform for the protection of the operator.

[Title 296 WAC—p 2202]

(b) Hydraulic or pneumatic systems shall have a minimum bursting strength of at least four times the operating pressure for which the system is designed.

(c) The basic structural elements of the hydraulic or articulating boom shall have a safety factor of three.

(d) Each hydraulic or pneumatic system for the boom shall be equipped with a pilot operated check valve or other appropriate device to prevent free fall in the event of hydraulic failure.

(2) The requirements related to the controlling of elevated platforms are addressed in this subsection.

(a) A control or device shall be provided at both the lower control station and the platform control station to allow either operator to completely deactivate the platform controls. During deactivation of the platform controls, the lower controls shall remain operable.

(b) A plate shall be located at the platform control unit or units listing the following information:

(i) Model and serial number of the manufacturer;

(ii) Rated capacity of the platform;

(iii) Operating pressure of the hydraulic or pneumatic systems or both;

(iv) Caution or restriction of operation or both;

(v) Control instructions;

(vi) This plate shall be clearly visible to the operator at the lower control position.

(c) There shall be an operator at the lower controls at all times while the fire fighter is in the bucket.

(d) The operator at the lower controls shall make certain the fire fighter on the platform is secured by his life belt or equivalent before raising platform.

(3) The requirements for testing elevated platforms and related equipment are outlined in this subsection.

(a) Annually the apparatus and platform shall be tested by the steps outlined in the following items:

(i) The apparatus shall be placed on solid level ground, brakes set, wheels chocked, and outriggers set to stabilize the apparatus.

(ii) The platform shall be placed in the manufacturers suggested strongest point three feet above the ground (measure from ground to center of platform's bottom).

(iii) Once in the aforementioned position, sand bags or a suitable substitute will be placed on the platform until the load totals 1-1/2 times its rated capacity, and maintained there for five minutes.

(iv) Upon completion of the five minutes, a measurement will again be taken from the ground to center of platform bottom. If the measurement measures a difference of more than two inches, the apparatus shall be taken out of service and repaired and retested until able to do so.

(v) Using the same static load of 1-1/2 the rated capacity, the apparatus will be operated through its entire range of motion. Failure to pass the test requires that the apparatus be placed out of service until it can be repaired and can properly complete the test.

(vi) The apparatus will be placed on a slope of 5 degrees and 1-1/2 times its rated capacity in weight will be placed in the basket. The 5 degree slope will be

downward in the direction most likely to cause the apparatus to overturn and the basket will be operated through its entire range of motion.

(b) It is recommended that the boom section as well as the support section of the apparatus which supports the turntable should be nondestructively tested by a certified testing agency every five years. After any accident that causes structural damage this test shall be performed and all defects detected shall be corrected before apparatus is returned to service.

(c) Elevated platform testing shall follow the recommendations of the current National Fire Code.

(d) Fire apparatus elevated platforms shall be positioned for the greatest stability feasible at the fire scene.

(4) Communications. (a) A two-way voice communication system shall be installed between the platform and the lower control station.

(5) The automotive apparatus used in conjunction with elevated platforms shall be used in accordance with the following subdivisions:

(a) Hand or air brakes shall be set before the platform is operated.

(b) Jacks or outriggers shall be used if the platform is to be elevated.

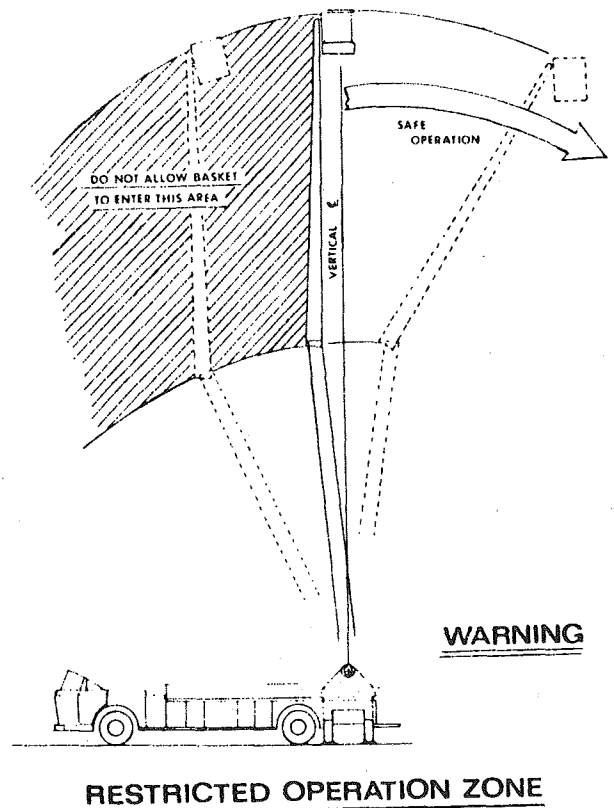
(c) Wheel blocks shall also be used when the platform is in operation unless the type of apparatus is one whose wheels lift off the ground when the jacks or outriggers are engaged.

(d) Ground plates shall be used under the outriggers or jacks any time apparatus is not on a concrete paved street or alley.

(e) Sand shall be put under jacks, outriggers and wheels when operating on ice or snow.

(6) Appliances mounted on elevated platforms.

(a) Platform mounted monitors shall be operated in accordance with the manufacturer's instructions.



[Statutory Authority: RCW 49.17.040 and 49.17.050. 83-24-013 (Order 83-34), § 296-305-110, filed 11/30/83; Order 77-20, § 296-305-110, filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.]

**WAC 296-305-115 Electrical.** (1) Temporary lights shall be equipped with 20 ampere capacity electric cords with connections and insulation maintained in safe condition.

(2) Temporary lights shall be equipped with guards to prevent accidental contact with the bulb, except that guards are not required when the construction of the reflector is such that the bulb is deeply recessed.

(3) Portable type hand lamps shall be of the molded composition or other type approved for the purpose.

(4) Hand lamps shall be equipped with a handle and a substantial guard over the bulb and attached to the lampholder or the handle.

[Order 77-20, § 296-305-115, filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.]

**Chapter 296-306 WAC  
SAFETY STANDARDS FOR AGRICULTURE**

**WAC**

**PART A—GENERAL AND EDUCATIONAL REQUIREMENTS**

- 296-306-003 Subsections, subdivisions, items, subitems, and segments.
- 296-306-006 Equipment approval by nonstate agency or organization.
- 296-306-009 Equipment whether or not owned by, or under control of the employer.
- 296-306-010 Purpose and scope.
- 296-306-012 Definitions applicable to all sections of this chapter.

- 296-306-015 Variance procedures.  
 296-306-020 Serious injury reporting.  
 296-306-025 Management's responsibility.  
 296-306-030 Employee's responsibility.

**PART B—FIRST-AID REQUIREMENTS**

- 296-306-035 Accident prevention program.  
 296-306-040 Safety bulletin board.  
 296-306-045 First-aid training and certification.  
 296-306-050 First-aid kit.  
 296-306-055 Safe place standards.

**PART C—HAND TOOLS**

- 296-306-057 Hand tools.

**PART D—PERSONAL PROTECTIVE EQUIPMENT**

- 296-306-060 Personal protective equipment.

**PART E—MATERIALS HANDLING, FARM SHOPS, GUARDING OF TOOLS**

- 296-306-065 Materials handling and storage.  
 296-306-070 Farm shops.  
 296-306-075 Bench grinders.  
 296-306-080 Guarding of hand-held portable power tools.

**PART F—FIRE PROTECTION AND IGNITION SOURCES**

- 296-306-085 Fire protection and ignition sources.

**PART G—STORAGE AND HANDLING OF ANHYDROUS AMMONIA**

- 296-306-090 Storage and handling of anhydrous ammonia.

**PART H—LADDERS, AERIAL MANLIFTS, ELEVATED WORK PLATFORMS, BULK STORAGE, PITS, AND TRENCHES**

- 296-306-095 Elevated walkways and platforms.  
 296-306-100 Handrails.  
 296-306-105 Orchard ladders.  
 296-306-110 Job-made ladders.  
 296-306-115 Bins, bunkers, hoppers, tanks, pits and trenches.  
 296-306-120 Aerial manlift equipment.

**PART I—WELDING**

- 296-306-125 Gas welding and cutting.  
 296-306-130 Welding.  
 296-306-135 Arc welding and cutting.  
 296-306-140 Welding areas protected.

**PART J—ELECTRICAL**

- 296-306-145 Electrical.

**PART K—GENERAL REQUIREMENTS FOR AGRICULTURAL EQUIPMENT AND TRUCKS**

- 296-306-150 Slow-moving vehicles.  
 296-306-155 General requirements for maintenance of farm motor vehicles and equipment.  
 296-306-160 Vehicles.  
 296-306-165 General requirements for all agricultural equipment.  
 296-306-170 Auger conveying equipment.  
 296-306-175 Farm field equipment guarding.  
 296-306-180 Farmstead equipment.

**PART L—ROLLOVER PROTECTIVE STRUCTURES (ROPS) FOR TRACTORS USED IN AGRICULTURE AND INDUSTRY**

- 296-306-200 Rollover protective structures (ROPS) for tractors used in agricultural operations.  
 296-306-250 Protective frames for wheel type agricultural tractors—Test procedures and performance requirements—Purpose.  
 296-306-25003 Types of tests.  
 296-306-25005 Description.  
 296-306-25007 Test procedures.  
 296-306-25009 Performance requirements.  
 296-306-25013 Protective enclosures for wheel-type agricultural tractors—Test procedures and performance requirements—Purpose.  
 296-306-25017 Types of tests.  
 296-306-25019 Description.  
 296-306-25021 Test procedures.

- 296-306-25023 Performance requirements.  
 296-306-25095 Exhibit B—Figures C-1 thru C-16.  
 296-306-260 Rollover protective structures (ROPS) for material handling equipment.  
 296-306-26001 Minimum performance criteria for rollover protective structures for designated scrapers, loaders, dozers, graders, and crawler tractors.  
 296-306-265 Protective frame (ROPS) test procedures and performance requirements for wheel-type agricultural and industrial tractors used in agriculture.  
 296-306-270 Overhead protection for operators of agricultural and industrial tractors.  
 296-306-27095 Exhibit B—Figures V-1 through V-28.  
 296-306-275 Seatbelts.

**PART M—FIELD SANITATION**

- 296-306-300 Field sanitation—Scope.  
 296-306-310 Field sanitation—Definitions.  
 296-306-320 Field sanitation—Requirements.

**DISPOSITION OF SECTIONS FORMERLY CODIFIED IN THIS CHAPTER**

- 296-306-005 Foreword. [Order 75-2, § 296-306-005, filed 1/24/75.] Repealed by 87-09-079 (Order 86-46), filed 4/22/87. Statutory Authority: RCW 49.17.040 and 49.17.050.

**PART A—GENERAL AND EDUCATIONAL REQUIREMENTS**

**WAC 296-306-003 Subsections, subdivisions, items, subitems, and segments.** (1) That portion of section numeration appearing after the chapter designation appears in either a three digit or a five digit format (e.g., WAC 296-306-330 and 296-306-33002). The final two digits of the section number are implied decimal extensions of the first three digits and represent a further division of the three digit enumeration.

(2) Sections of this chapter may be divided into subsections (1), (2), (3), etc., which may in turn be divided into subdivisions (a), (b), (c), etc., which may be further divided into items (i), (ii), (iii), etc., which may be further divided into subitems (A), (B), (C), etc., which may be further divided into segments (I), (II), (III), etc., all according to the following hierarchy, e.g.,

Sections	296-306-330 and 296-306-33002
Subsections	(1) (2)
Subdivisions	(a) (b)
Items	(i) (ii)
Subitems	(A) (B)
Segments	(I) (II)

Note: "Part" as used in this standard means a major division of this chapter relating to a specific topic or topics and containing various related sections.

[Statutory Authority: RCW 49.17.040 and 49.17.050, 87-09-079 (Order 86-46), § 296-306-003, filed 4/22/87.]

**WAC 296-306-006 Equipment approval by nonstate agency or organization.** Whenever a provision of this chapter states that only that equipment or those processes approved by an agency or organization other than the department of labor and industries, such as the Underwriters Laboratories or the Bureau of Mines, shall be utilized, that provision shall be construed to mean that approval of such equipment or process by the designated agency or group shall be prima facie evidence of compliance with the provisions of this chapter.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 87-09-079 (Order 86-46), § 296-306-006, filed 4/22/87.]

**WAC 296-306-009 Equipment whether or not owned by, or under control of the employer.** (1) It is the employer's responsibility to ensure that any defective equipment or tools are not used.

(2) When any tool or piece of equipment fails to meet the requirements of any safety standard or recognized safe practice, the tool or equipment shall not be used.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 87-09-079 (Order 86-46), § 296-306-009, filed 4/22/87.]

**WAC 296-306-010 Purpose and scope.** (1) The standards in this chapter apply to all agricultural operations with one or more employees, when such employees are covered by the Washington Industrial Safety and Health Act (WISHA).

(2) In the event that the provisions of this chapter conflict with the provisions contained in any other chapter of Title 296 WAC, this chapter shall prevail. Sections of other chapters 296-24 WAC apply only when specifically referenced in this chapter.

(3) When employees are assigned to perform tasks other than those directly related to agricultural operations, the proper chapter of Title 296 WAC shall apply.

(4) The air contaminant standards contained in WAC 296-62-073 through 296-62-07389 and 296-62-075 do not apply to chapter 296-306 WAC, Safety standards for agricultural code.

(5) The requirement that the employer shall develop and maintain a hazard communication program as required by WAC 296-62-054 through 296-62-05427 which will provide information to all employees relative to hazardous chemicals or substances to which they are exposed or may become exposed in the course of their employment, shall apply to chapter 296-306 WAC.

Note: Such assignments may involve logging, mining, sawmills, etc., when the products of such activities are removed from the farm site for commercial distribution.

[Statutory Authority: Chapter 49.17 RCW. 89-11-035 (Order 89-03), § 296-306-010, filed 5/15/89, effective 6/30/89; 88-14-108 (Order 88-11), § 296-306-010, filed 7/6/88. Statutory Authority: RCW 49.17.040, 49.17.150, and 49.17.240. 79-08-115 (Order 79-9), § 296-306-010, filed 7/31/79; Order 75-2, § 296-306-010, filed 1/24/75.]

**WAC 296-306-012 Definitions applicable to all sections of this chapter.**

Note: Meaning of words. Unless the context indicates otherwise, words used in this chapter shall have the meaning given in this section.

(1) "Approved" means approved by the director of the department of labor and industries or his authorized representative: *Provided, however,* That should a provision of this chapter state that approval by an agency or organization other than the department of labor and industries is required, such as Underwriters' Laboratories or the Bureau of Mines, the provisions of WAC 296-24-006 shall apply.

(2) "Authorized person" means a person approved or assigned by the employer to perform a specific type of duty or duties or to be at a specific location or locations at the job site.

(3) "Competent person" means one who is capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt corrective action to eliminate them.

(4) "Department" means the department of labor and industries.

(5) "Director" means the director of the department of labor and industries, or designated representative.

(6) "Employer" means any person, firm, corporation, partnership, business trust, legal representative, or other business entity which engages in any business, industry, profession, or activity in this state and employs one or more employees or who contracts with one or more persons, the essence of which is the personal labor of such person or persons and includes the state, counties, cities, and all municipal corporations, public corporations, political subdivisions of the state, and charitable organizations: *Provided,* That any person, partnership, or business entity not having employees, and who is covered by the industrial insurance act shall be considered both an employer and an employee.

(7) "Hazard" means that condition, potential or inherent, which can cause injury, death, or occupational disease.

(8) "Safety factor" means the ratio of the ultimate breaking strength of a member or piece of material or equipment to the actual working stress or safe load when in use.

(9) "Shall" or "must" means mandatory.

(10) "Should" or "may" means recommended.

(11) "Standard safeguard" means a device designed and constructed with the object of removing the hazard of accident incidental to the machine, appliance, tool, building, or equipment to which it is attached.

Standard safeguards shall be constructed of either metal or wood or other suitable material or a combination of these. The final determination of the sufficiency of any safeguard rests with the director of the department of labor and industries through the division of safety.

(12) "Suitable" means that which fits, or has the qualities or qualifications to meet a given purpose, occasion, condition, function, or circumstance.

(13) "Working day," for the purpose of appeals and accident reporting, means a calendar day, except Saturdays, Sundays, and legal holidays, as set forth in RCW

1.16.050, as now or hereafter amended, and for the purposes of the computation of time within which an act is to be done under the provisions of this chapter, shall be computed by excluding the first working day and including the last working day.

(14) "Workmen," "personnel," "man," "person," "employee," and other terms of like meaning, unless the context of the provision containing such term indicates otherwise, mean an employee of an employer who is employed in the business of his employer whether by way of manual labor or otherwise and every person in this state who is engaged in the employment of or who is working under an independent contract the essence of which is his personal labor for an employer whether by manual labor or otherwise.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 87-09-079 (Order 86-46), § 296-306-012, filed 4/22/87.]

**WAC 296-306-015 Variance procedures.** (1) In the event some requirements of this agricultural safety standard become impractical under certain conditions, the director of the department of labor and industries may permit a variation from the requirements if the employer provides *equal protection* by other means and complies with the other requirements of chapter 296-350 WAC, variances.

(2) The written application must certify that the employer has properly notified his employees of his application for a variance. Proper notice to employees shall mean that a copy of the written application has been posted in a place or places reasonably accessible to all employees. In addition, a copy of the application shall be mailed to the authorized representative of such employees, if any. The notice shall advise employees and their representatives of their right to request the director to conduct a hearing on the variance application. All the above notices to employees must be made prior to the date the employer makes written application to the director.

Note: An employer who wishes to apply for a permanent or temporary variance shall make a request in writing to the Engineering Section, Department of Labor and Industries, Division of Industrial Safety and Health, P.O. Box 207, Olympia, Washington, 98504. The engineering section will respond by furnishing application forms along with the instructions necessary to meet the intent of the law. A copy of chapter 296-350 WAC, variances will be included if specifically requested.

[Order 75-2, § 296-306-015, filed 1/24/75.]

**WAC 296-306-020 Serious injury reporting.** (1) The employer or someone in his behalf shall notify the nearest office of the department of labor and industries within 24 hours of the date of an accident which causes a fatal or possibly fatal injury, an accident which involves acute exposures to pesticides or herbicides or an accident which causes injury requiring hospitalization of any employees.

(2) When any investigator from the department's division of safety and health arrives, the farm employer shall assign to assist in the investigation any persons the investigator deems necessary.

[Title 296 WAC—p 2206]

(3) When a fatality occurs, equipment involved in the accident shall not be moved until after a representative from the division of industrial safety and health has completed an investigation unless the equipment must be moved to prevent additional accidents, or to remove the victim.

[Order 75-2, § 296-306-020, filed 1/24/75.]

**WAC 296-306-025 Management's responsibility.** It shall be the responsibility of management to maintain and supervise:

- (1) A safe and healthful working environment.
- (2) An accident prevention program as required by these standards.
- (3) A system for reporting and recording accidents that will fulfill statistical requirements of the department of labor and industries. (See chapter 296-27 WAC.)
- (4) Safety education and training programs.
- (5) Temporary labor camps, as prescribed in WAC 296-24-125 through 296-24-12523, and shall comply with these rules and regulations.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 87-09-079 (Order 86-46), § 296-306-025, filed 4/22/87. Statutory Authority: RCW 49.17.040, 49.17.150 and 49.17.240. 79-08-115 (Order 79-9), § 296-306-025, filed 7/31/79; Order 77-12, § 296-306-025, filed 7/11/77; Order 75-2, § 296-306-025, filed 1/24/75.]

**WAC 296-306-030 Employee's responsibility.** (1) Employees shall cooperate with the employer and other employees in efforts to eliminate accidents.

(2) Employees shall be informed of and observe all safe practices.

(3) Employees shall notify the employer of unsafe conditions of equipment or work places.

(4) Employees shall use all required safety devices and protective equipment.

(5) Employees shall not willfully damage personal protective equipment.

(6) Each employee shall promptly report any job-related injury or illness to his or her immediate supervisor, regardless of the degree of severity.

(7) Employees shall not engage in any activity unrelated to work that may cause injury to other employees during the course of performing work assignments.

(8) Employees shall attend any required training and/or orientation programs designed to increase their competency in occupational safety and health.

(9) Employees shall not report to work under the influence of alcohol or controlled substances. Alcohol or controlled substances shall not be brought on the work site.

[Order 75-2, § 296-306-030, filed 1/24/75.]

## PART B—FIRST-AID REQUIREMENTS

**WAC 296-306-035 Accident prevention program.**

(1) The agricultural employer shall instruct all employees in safe working practices. Such instruction shall be tailored to the types of hazards to which the employees will be exposed.

(2) The agricultural employer or a delegated representative shall schedule and take part in monthly safety meetings with year-round employee(s), or representatives they may select.

(3) The employer shall conduct weekly inspections of job sites, materials, equipment and operating procedures. Findings from such inspections shall be discussed at safety meetings.

Note: Employers should consider the advantage of having an employee representative participate in such inspections.

(4) A record of safety meetings and inspections shall be kept by the employer. This record shall be made available to personnel of the department of labor and industries upon request.

(5) Agricultural employers shall give appropriate safety instruction to seasonal employees and temporary crews at the beginning of employment.

[Order 75-2, § 296-306-035, filed 1/24/75.]

**WAC 296-306-040 Safety bulletin board.** (1) A bulletin board or posting area large enough to display the required safety poster (Form WISHA-1) and other safety education material shall be provided.

(2) The bulletin board shall be positioned so as to be readily visible and located in a place where employees gather during some part of the work day (i.e., at the entrance to a field, a parking area, or in a farm building).

(3) If for any reason any employee is unable to read the notices posted on the bulletin board, the employer shall ensure that the message of the required poster explaining employee rights is communicated to the employee in terms he or she understands. This same requirement shall apply to variance application, denials or grants and to any other notice affecting the employee's rights under WISHA.

(4) Posting shall be in appropriate language, Spanish, etc.

[Order 75-2, § 296-306-040, filed 1/24/75.]

**WAC 296-306-045 First-aid training and certification.** (1) One or more persons qualified to render first-aid shall be assigned to each farm or crew during working hours. "Qualified" means that the person holds a current certificate of first-aid training from the department of labor and industries, the United States Bureau of Mines, the American Red Cross or other course of training with equivalent content and hours. A "current certificate" must be no more than three years old.

(2) The above requirement will be met if the farm operator or the spouse of the farm operator holds a current first-aid certificate and is available.

(3) The above requirements shall not apply to employees whose duties require them to be working alone at isolated work stations. However, they shall be checked at intervals by some method agreed upon by the employer and the employee.

[Order 75-2, § 296-306-045, filed 1/24/75.]

**WAC 296-306-050 First-aid kit.** (1) All employers covered by WISHA shall furnish first-aid kits as required by the division of safety and health, department of labor and industries.

(2) First-aid supplies shall be readily accessible and provided for persons working alone at isolated stations.

Note: A ten-package kit shall contain at least the following items:

- 1 package 1-inch adhesive bandages (16 per package)
- 2 packages 4-inch bandage compress (1 per package)
- 1 package scissors and tweezers (1 each per package)
- 2 packages 40-inch triangular bandage (1 per package)
- 1 package antiseptic soap or pads (3 per package)
- 2 packages eye dressing (1 per package)
- 1 package 24" x 72" absorbent gauze (1 per package)

Note: Items may be added at employer's option.

(3) First-aid kit sizes and numbers shall be determined by the number of employees normally dependent upon each kit as outlined in the following table:

NUMBER OF EMPLOYEES NORMALLY ASSIGNED TO WORKSITE	MINIMUM FIRST-AID SUPPLIES REQUIRED AT WORKSITE
1 - 15 employees	1 ten-package kit
16 - 30 employees	2 ten-package kits or 1 24-package kit
31 - 50 employees	3 ten-package kits or 1 36-package kit
Over 50 employees (Within 1/2 mile radius)	First-aid Station - 136 package kit plus Stretcher and 2 blankets

Note: Kits may be carried in any motor vehicle when such vehicle is used near the crew. Such vehicles may be considered stations when so identified and when the driver is trained in first-aid.

(4) Items used from first-aid kits shall be replaced before the next shift. Kits shall be checked at least weekly for unauthorized removal of items.

[Order 75-2, § 296-306-050, filed 1/24/75.]

**WAC 296-306-055 Safe place standards.** (1) Each employer shall furnish to each of his employees a place of employment free from recognized controllable hazards likely to cause serious injury or death to his employees.

(2) Every employer shall furnish and require the use of any safety devices and safeguards that are needed to control recognized hazards. All agricultural methods, operations, and processes shall be so designed as to promote the safety and health of employees.

(3) No employer shall require any employee to engage in any duty or enter any place which is not safe.

(4) No person shall:

(a) Remove, displace, damage, destroy or carry off any safety device, safeguard, notice or warning furnished for use in any employment or place of employment.

(b) Interfere in any way with the use of any safety device, method or process adopted for the protection of any employee.



(5) Intoxicating beverages or narcotics shall not be permitted or used in or around work sites. Workers under the influence of alcohol or narcotics shall not be permitted on the work site. This rule shall not apply to persons taking prescription drugs and/or narcotics as directed by a physician providing such use does not endanger the worker or others.

[Order 75-2, § 296-306-055, filed 1/24/75.]

### PART C--HAND TOOLS

**WAC 296-306-057 Hand tools.** (1) Hoes with handles less than four feet in length or any hand tool used for weeding or thinning crops, when used in a stooped position, are prohibited.

(2) Hand tools shall be kept in good condition.

(3) Hand tools shall be safely stored when not in use.

(4) Hand tools which are unsafe or defective shall not be used.

Note: When there is no other practical or adequate alternative, the director of the department of labor and industries, or his authorized representative may permit a variance pursuant to procedures prescribed by chapter 80, Laws of 1973, RCW 49.17.080 and 49.17.090 and chapter 296-350 WAC.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 87-09-079 (Order 86-46), § 296-306-057, filed 4/22/87.]

### PART D--PERSONAL PROTECTIVE EQUIPMENT

**WAC 296-306-060 Personal protective equipment.**

(1) Employers shall make certain that employees are protected from injury or impairment of any bodily function that might occur through absorption, inhalation or physical contact of any substance, vapor, radiation or mechanical irritant. Adequate protective equipment for eyes, face, head and extremities, protective clothing, respiratory devices, shields and barriers shall be provided and used wherever appropriate. Such equipment shall be maintained in sanitary and reliable condition.

(2) If employees provide their own protective equipment, the employer shall require that such equipment be adequate, and properly maintained and sanitary.

(3) Every item of personal protective equipment shall be designed and constructed in such a way that it will be safe to use for the work being done, and reasonably comfortable to wear.

(4) Eye protectors shall be required wherever workers are exposed to flying objects, welding or cutting glare, injurious liquids, injurious radiation or any combination of these. Eye protectors shall meet the criteria of the American National Standard for Occupational and Educational Eye and Face Protection.

(5) The respiratory protection requirements of the general occupational health standards, chapter 296-62 WAC, shall apply.

(6) Employers shall instruct each employee in the proper use of any item of personal protective equipment used. Such instruction shall include, but not be limited to, any special limitations or precautions indicated by the manufacturer.

(7) At least five gallons of water shall be supplied for emergency while using pesticides or herbicides.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 83-24-013 (Order 83-34), § 296-306-060, filed 11/30/83; Order 75-2, § 296-306-060, filed 1/24/75.]

### PART E--MATERIALS HANDLING, FARM SHOPS, GUARDING OF TOOLS

**WAC 296-306-065 Materials handling and storage.**

(1) Where mechanical handling equipment is used, safe clearances of three feet shall be allowed for aisles, through doorways and wherever turns or passage must be made. Aisles and passageways shall be kept clear and in good repair, with no obstructions that could create hazards.

(2) Bags, bales, boxes and other containers stored in tiers shall be made secure against sliding or collapse.

(3) Storage areas shall be kept free from any accumulation of materials that could cause tripping, fire or explosion.

(4) Workers shall be instructed in proper lifting or moving techniques and methods. Mechanical devices or assistance in lifting shall be used when moving heavy objects.

(5) When removing materials from piles on horizontal surfaces, the face of the pile shall be removed in a manner that will prevent overhangs.

[Order 75-2, § 296-306-065, filed 1/24/75.]

**WAC 296-306-070 Farm shops.** Farm shops shall be exempt from these standards when the following conditions are met:

(1) When the shop equipment is used solely by the owner or others not covered by WISHA.

(2) When employees are not permitted in the shop while shop equipment is being operated.

[Order 75-2, § 296-306-070, filed 1/24/75.]

**WAC 296-306-075 Bench grinders.** (1) The safety guard required on bench grinders shall cover the spindle end, nut, and flange projections. The safety guard shall be mounted so as to maintain proper alignment with the wheel, and the strength of the fastenings shall exceed the strength of the guard.

Note: This requirement does not apply to natural sandstone wheels, or metal, wooden, cloth or paper discs having a layer of abrasive on the surface.

(2) Work rests shall be used to support the work. These shall be of rigid construction and designed to be adjustable to compensate for wheel wear. Work rests shall be kept adjusted sufficiently close to the wheel to prevent the work from being jammed between the wheel and the rest. Adjustment of the work rest shall not be made while the wheel is turning.

(3) Goggles or face shields shall be used when grinding.

[Order 75-2, § 296-306-075, filed 1/24/75.]

**WAC 296-306-080 Guarding of hand-held portable power tools.** (1) "Dead man" controls. Each hand-held, power-driven tool shall be provided with a "dead man" control, such as a spring-actuated switch, valve, or equivalent device, so that the power will be automatically shut off whenever the operator releases the control.

(2) Grounding. Electrical grounding requirements for portable machinery shall conform to the requirements of this section.

(a) The frames and all exposed, noncurrent-carrying metal parts of portable electric machinery operated at more than 90 volts to ground shall be grounded. Other portable motors driving electric tools which are held in the hand while being operated shall be grounded if they operate at more than 90 volts to ground. The ground shall be provided through use of a separate ground wire and polarized plug and receptacle.

(b) Double insulated tools which are designed and used in accordance with the requirements of Article 250-45 of the National Electrical Code (1971 edition) are exempted from the above grounding requirement in (a).

(3) Portable belt sanding machines. Belt sanding machines shall be provided with guards at each nip point where the sanding belt runs onto a pulley. These guards shall effectively prevent the hands or fingers of the operator from coming in contact with the nip points.

(4) All portable, power-driven saws shall be equipped with guards above and below the base plate or shoe. The upper guard shall cover the saw to the depth of the teeth, except for the minimum arc required to permit the base to be tilted for bevel cuts. The lower guard shall cover the saw to the depth of the teeth, except for the

minimum arc required to allow proper retraction and contact with the work. When the tool is withdrawn from the work, the lower guard shall automatically and instantly return to covering position. Pruning and chain saws are exempt from this requirement.

(5) Cracked saws. All cracked saws shall be removed from service.

[Order 75-2, § 296-306-080, filed 1/24/75.]

**PART F--FIRE PROTECTION AND IGNITION SOURCES**

**WAC 296-306-085 Fire protection and ignition sources.** (1) Portable fire extinguishers shall be constructed, tested, maintained and used in accordance with the recommendations specified by the National Fire Protection Association's No. 10A-1970.

Note: The supplier of the extinguisher or local fire official can furnish this information.

(2) Fire extinguishing equipment suitable for use for the type or types of fire which could be expected in an area shall be provided and shall be available at all times.






(3) Each person who is expected to use fire extinguishing equipment shall be instructed as to its proper use.

(4) Employees shall be instructed on procedures to be followed in case of fire.

(5) Areas where fire or explosion hazards exist shall be posted with NO SMOKING or other suitable signs which warn of such hazards.

(6) Vaporizing type extinguishers shall not be used.

**KNOW YOUR FIRE EXTINGUISHERS**

	WATER TYPE				FOAM	CARBON DIOXIDE	DRY CHEMICAL			
	STORED PRESSURE	CARTRIDGE OPERATED	WATER PUMP TANK	SODA ACID			SODIUM OR POTASSIUM BICARBONATE	MULTI-PURPOSE ABC		SHOULD PRESSURE
<b>CLASS A FIRES</b> WOOD, PAPER, TRASH HAVING GLOWING EMBERS 	YES	YES	YES	YES	YES	NO (BUT WILL CONTROL SMALL SURFACE FIRES)	NO (BUT WILL CONTROL SMALL SURFACE FIRES)	NO (BUT WILL CONTROL SMALL SURFACE FIRES)	YES	YES
<b>CLASS B FIRES</b> FLAMMABLE LIQUIDS, GASOLINE, OIL, PAINTS, GREASE, ETC. 	NO	NO	NO	NO	YES	YES	YES	YES	YES	YES
<b>CLASS C FIRES</b> ELECTRICAL EQUIPMENT 	NO	NO	NO	NO	NO	YES	YES	YES	YES	YES
<b>CLASS D FIRES</b> COMBUSTIBLE METALS 	<b>SPECIAL EXTINGUISHING AGENTS APPROVED BY RECOGNIZED TESTING LABORATORIES</b>									
<b>METHOD OF OPERATION</b>	PULL PIN-SQUEEZE HANDLE	TURN UPSIDE DOWN AND BUMP	PUMP HANDLE	TURN UPSIDE DOWN	TURN UPSIDE DOWN	PULL PIN-SQUEEZE LEVER	RUPTURE CARTRIDGE-SQUEEZE LEVER	PULL PIN-SQUEEZE HANDLE	PULL PIN-SQUEEZE HANDLE	RUPTURE CARTRIDGE-SQUEEZE LEVER
<b>RANGE</b>	30' - 40'	30' - 40'	30' - 40'	30' - 40'	30' - 40'	3' - 8'	5' - 20'	5' - 20'	5' - 20'	5' - 20'
<b>MAINTENANCE</b>	CHECK AIR PRESSURE GAUGE MONTHLY	WEIGH GAS CARTRIDGE, ADD WATER IF REQUIRED ANNUALLY	DISCHARGE AND FILL WITH WATER ANNUALLY	DISCHARGE ANNUALLY, RECHARGE	DISCHARGE ANNUALLY, RECHARGE	WEIGH SEMI-ANNUALLY	WEIGH GAS CARTRIDGE, CHECK CONDITION OF DRY CHEMICAL ANNUALLY	CHECK PRESSURE GAUGE AND CONDITION OF DRY CHEMICAL ANNUALLY	CHECK PRESSURE GAUGE AND CONDITION OF DRY CHEMICAL ANNUALLY	WEIGH GAS CARTRIDGE, CHECK CONDITION OF DRY CHEMICAL ANNUALLY

Note: The above department of labor and industries chart on special extinguishing agents approved by recognized testing laboratories is set forth as filed in the office of the code reviser. It is available for inspection in the code reviser's office as well as the department of labor and industries.

[Statutory Authority: Chapter 49.17 RCW. 88-14-108 (Order 88-11), § 296-306-085, filed 7/6/88; Order 75-2, § 296-306-085, filed 1/24/75.]

### PART G--STORAGE AND HANDLING OF ANHYDROUS AMMONIA

**WAC 296-306-090 Storage and handling of anhydrous ammonia.** (1) Any agricultural employer or employee who transports or applies anhydrous ammonia shall obtain and comply with the anhydrous ammonia safety rules (WAC 296-24-51019 through 296-24-51021). These may be obtained from the department of labor and industries, division of industrial safety and health.

(2) Gloves and goggles and/or a face shield shall be used by all employees while working on or with charged anhydrous ammonia equipment.

(3) Equipment shall be inspected before each day's work. Conditions that would contribute to accidental leakage shall be corrected.

(4) Hose end-valves must be in a closed position when not in use to prevent accidental discharge in case the main valve is opened.

(5) Five gallons or more of clean water must be provided on the equipment.

(6) Relief and vapor valves shall be positioned to discharge away from operator's working position.

[Statutory Authority: Chapter 49.17 RCW. 88-14-108 (Order 88-11), § 296-306-090, filed 7/6/88; Order 75-2, § 296-306-090, filed 1/24/75.]

### PART H--LADDERS, AERIAL MANLIFTS, ELEVATED WORK PLATFORMS, BULK STORAGE, PITS, AND TRENCHES

**WAC 296-306-095 Elevated walkways and platforms.** (1) Elevated walkways, platforms and open-sided floors over 48 inches in height shall be guarded by safety railings. Such railings shall have a top rail approximately 42 inches from the floor and a midrail between the top rail and the working surface. Guard rails shall be strong enough to withstand at least 200 pounds side thrust against the top rail.

(2) Railings may be omitted from particular sections of open-sided floors, platforms or walkways where guard rails impair operations.

(3) Toeboards shall be required on platforms with railing where objects falling from the platform could create a hazard to persons below.

[Order 75-2, § 296-306-095, filed 1/24/75.]

**WAC 296-306-100 Handrails.** (1) Each fixed stairway with four or more risers, used by employees, shall be equipped with a handrail.

[Title 296 WAC--p 2210]

(2) Handrails shall be mounted from 30 to 34 inches above the tread.

(3) Handrails shall be strong enough to withstand a load of at least 200 pounds applied in any direction.

[Order 75-2, § 296-306-100, filed 1/24/75.]

**WAC 296-306-105 Orchard ladders.** (1) Orchard ladders shall be maintained in good condition at all times. Joints between steps and side rails shall be tight. All hardware and fittings shall be securely attached, and the movable parts shall operate freely, without binding or undue play.

(2) Ladders shall be inspected prior to being used. Those ladders which have developed defects shall be withdrawn from service for repair or discard.

(3) Rungs shall be kept reasonably free of any substance which would make them hazardous.

(4) Proper instruction in the use of orchard ladders shall be given each employee at the beginning of employment.

[Order 75-2, § 296-306-105, filed 1/24/75.]

**WAC 296-306-110 Job-made ladders.** (1) A job-made ladder is one built by the employer or his employees.

(2) One-by-four-inch nominal lumber, or stronger, shall be used for cleats.

(3) Cleats shall be inset into the edges of side rails to a depth of one-half inch, or filler blocks shall be used on the rails between the cleats.

(4) Each cleat shall be fastened to each rail with three 8d common wire nails or other fasteners of equal strength.

(5) Cleats shall be uniformly spaced at a distance of approximately 12 inches from the top of one cleat to the top of the next.

(6) Side rails shall be continuous, unless splices used develop the full strength of a continuous rail of equal length.

[Order 75-2, § 296-306-110, filed 1/24/75.]

**WAC 296-306-115 Bins, bunkers, hoppers, tanks, pits and trenches.** (1) No employee shall enter any bin, bunker, hopper or similar area when there is a danger that loose materials (such as chips, sand, grain, gravel, sawdust, etc.) may collapse around the worker, unless the worker wears a safety belt with a lifeline attached and is attended by a helper.

(2) When employees are required to work in a trench or a pit 4 feet or more in depth, the trench or the pit shall be shored or shall be sloped to the angle of repose as shown in the following table:

Solid rock, shale or cemented sand and gravel-
Vertical - (90°)
Compacted gravels - 1/2:1 - (63°)
Average soils - 1:1 - (45°)
Compacted sharp sand - 1-1/2:1 - (34°)
Rounded, loose sand or gravel - 2:1 - (27°)
Clay, silt, loam - shoring required

Note: Silage pits are exempt from this section.

[Order 75-2, § 296-306-115, filed 1/24/75.]

**WAC 296-306-120 Aerial manlift equipment.** (1) Safety factor test data on working or structural components submitted by the manufacturer, by a competent testing laboratory, by a registered engineering firm or a registered engineer shall be acceptable evidence that the manlift meets minimum safety requirements. If, however, through use, a reasonable doubt arises as to whether or not this equipment will meet the above requirements, the division of industrial safety and health may require that appropriate tests be conducted and may order any corrections indicated.

(2) Working brake systems shall be on all aerial manlifts.

(3) Automatic restrictive orifices shall be installed in the hydraulic systems of aerial manlifts to the boom in position in case any part of the hydraulic pressure system should fail.

(4) Controls shall be guarded by partial enclosures in order to minimize the chances of accidental contact.

(5) The manufacturer's recommended maximum load limit shall be posted at a conspicuous place near the controls and shall be kept in a legible condition.

(6) The manufacturer's instructional manual, if any, shall be used to establish the proper operational sequences and maintenance procedures. If such a manual does not exist, the employer shall develop the necessary instructions. The instructions shall be available for reference by operators.

(7) A daily visual inspection and the tests in accordance with the manufacturer's recommendations shall be made by the assigned operator.

(8) Only workers qualified by reason of training or experience shall be permitted to operate aerial manlifts.

(9) Defective aerial manlift equipment shall be reported to the employer or his designated representative as soon as identified. The use of defective equipment is prohibited when the defect may cause an accident.

(10) When moving to and from the job site, the basket of the manlift shall be in the low position.

(11) Unsafe practices, including but not limited to, sitting or standing on the basket edge, standing on material placed across the basket, or working from a ladder set inside the basket, are prohibited.

(a) The basket shall not be rested on a fixed object in such a way that the weight of the boom is supported by the basket.

(b) The employee or any part of agricultural aerial man-lift equipment shall not come within a radius of ten feet from energized high voltage conductors, or into any part of the zone any distance above such a radius.

[Order 75-2, § 296-306-120, filed 1/24/75.]

## PART I--WELDING

**WAC 296-306-125 Gas welding and cutting.** Transporting, moving and storing compressed gas cylinders.

(1989 Ed.)

(1) Unless cylinders are firmly secured on a special carrier intended for this purpose, regulators shall be removed and valve protection caps put in place before cylinders are moved.

(2) Except for short periods of time while being moved, compressed gas cylinders shall be maintained in an upright position and secured against accidental upset by being chained or strapped to stationary objects or by being placed in secured positions on cylinder trucks or racks.

(3) Oxygen cylinders in storage shall be separated from fuel-gas cylinders or combustible materials (especially oil or grease), by a minimum distance of 20 feet.

[Order 75-2, § 296-306-125, filed 1/24/75.]

**WAC 296-306-130 Welding.** (1) Welding hose couplings shall be of the type that cannot be unlocked or disconnected by means of a straight pull without rotary motion.

(2) Welding hoses and cables shall not be placed in passageways unless provisions are made to protect them from damage from vehicles and to prevent them from becoming tripping hazards. Welding machines or gas cylinders shall be placed no nearer than four feet from either side of ladder or stair landings. In the event cables or hoses are placed on stairs, they shall be secured to the hand rails.

[Order 75-2, § 296-306-130, filed 1/24/75.]

**WAC 296-306-135 Arc welding and cutting.** Manual electrode holders.

(1) Only manual electrode holders which are specifically designed for arc welding and cutting, and capable of safely handling the maximum rated current required by the electrodes, shall be used.

(2) Any current-carrying parts passing through the portion of the holder which the arc welder or cutter grips in his hand, and the outer surfaces of the jaws of the holder, shall be fully insulated against the maximum voltage encountered to ground.

(3) When the arc welder or cutter has occasion to leave his work or to stop work for any appreciable length of time, or when the arc welding or cutting machine is to be moved, the power supply switch to the equipment shall be opened.

[Order 75-2, § 296-306-135, filed 1/24/75.]

**WAC 296-306-140 Welding areas protected.** Areas in which welding is being done shall be screened or barricaded to protect persons from flash burns, when practical and adequate ventilation provided. If the welding process cannot be isolated, all persons who may be exposed to the hazard of arc flash shall wear goggles or glasses with side shields that have tinted lenses.

[Order 75-2, § 296-306-140, filed 1/24/75.]

## PART J--ELECTRICAL

**WAC 296-306-145 Electrical.** General requirements.

[Title 296 WAC—p 2211]

(1) Main disconnects. To avoid accidental starts of machinery during maintenance or clean-up, the main disconnect(s) of machines shall first be locked out or disconnected from the power source.

Note: (Temporary) All 15- and 20- ampere receptacle outlets on single-phase circuits may have approved ground-fault circuit protection.

EXCEPTION: For branch-circuit extensions only in existing installations which do not have a grounding conductor in the branch-circuit, the grounding conductor of a grounding-type receptacle outlet may be grounded to a metal cold-water pipe near the equipment.

(2) Electric wire fences shall be controlled by a U.L. approved control box which regulates both voltage and amperage.

(3) Whenever work is performed near outside energized electrical conductors, employees and equipment shall be kept at least ten feet away from such conductors.

Note: Special precautionary instructions shall be given to employees handling portable metal irrigation pipe near energized circuits.

(4) After October 25, 1976, the following additional rules shall apply for electrical power sources:

(a) All circuit protection devices, including those which are an integral part of a motor, shall be of the manual reset type, except where:

(i) The employer can establish that because of the nature of the operation, distances involved, and the amount of time normally spent by employees in the area of the affected equipment, use of the manual reset device would be infeasible;

(ii) There is an electrical disconnect switch available to the employee within 15 feet of the equipment upon which maintenance or service is being performed; and

(iii) A sign is prominently posted near each hazardous component which warns the employee that unless the electrical disconnect switch is utilized, the motor could automatically reset while the employee is working on the hazardous component.

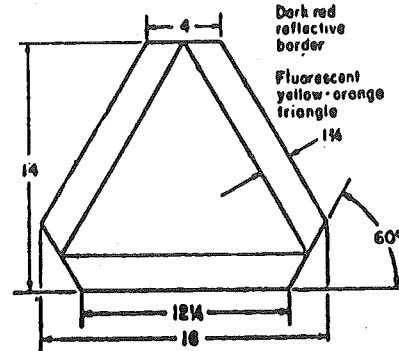
[Order 76-28, § 296-306-145, filed 9/28/76; Order 75-2, § 296-306-145, filed 1/24/75.]

### PART K--GENERAL REQUIREMENTS FOR AGRICULTURAL EQUIPMENT AND TRUCKS

**WAC 296-306-150 Slow-moving vehicles.** Farm tractors, farm equipment and implements of husbandry, when used on public roads are required by state law to have lamps, reflectors and a SLOW-MOVING emblem. At any time one-half hour after sunset to one-half hour before sunrise, slow moving vehicles must be equipped with necessary lights and reflectors.

(1) Slow-moving vehicle emblem. This emblem (see the following figure) consists of a fluorescent yellow-orange triangle with a dark red reflective border. The yellow-orange fluorescent triangle is a highly visible color for daylight exposure. The reflective border defines

the shape of the fluorescent color in daylight and creates a hollow red triangle in the path of motor vehicle headlights at night. The emblem is intended as a unique identification for, and it shall be used only on, vehicles which by design move slowly (25 M.P.H. or less) on the public roads.



[Order 75-2, § 296-306-150, filed 1/24/75.]

**WAC 296-306-155 General requirements for maintenance of farm motor vehicles and equipment.** (1) Before any person performs service or repair work under hydraulic or mechanical raised dump truck beds, blades, discs, etc., that raised portion of the equipment shall be manually pinned or blocked to prevent falling.

(2) Inflation of tires. Unmounted split-rim wheels shall be placed in a safety cage or other safety device which will prevent a split-rim from striking the worker if it should dislodge while the tire is being inflated.

(3) If a motor vehicle or other farm equipment is in an unsafe condition to operate, the operator shall report the suspected condition immediately to the person in charge. If any defect would make the vehicle or equipment unsafe to operate under existing conditions, the vehicle or equipment shall be removed from service by the person in charge and repaired before being used.

(4) Vehicles shall not be driven at speeds which exceed that which is safe under existing conditions.

(5) Motors shall be shut off prior to refueling. Care shall be taken to prevent fuel from spilling on hot parts.

[Order 75-2, § 296-306-155, filed 1/24/75.]

**WAC 296-306-160 Vehicles.** Motor vehicles shall be maintained in good mechanical condition at all times.

(1) Under no circumstances shall workers ride on fenders or running boards of vehicles.

(2) No worker shall ride in or on any vehicle with his legs hanging over the end or sides. A safety bar shall be placed across the rear opening of all crew trucks which are not equipped with tail gates.

(3) Vehicles used to transport workers shall be equipped with a means of preventing tools or materials from striking employees in the event of sudden starts, stops or turns.

(4) Explosives or highly inflammable and/or toxic materials shall not be carried in or on any vehicle while it is used to transport workers.

(5) Exhaust systems shall be installed and maintained in proper condition, and shall be designed to eliminate the exposure of the workers to exhaust gases and fumes.

(6) All vehicles which are specifically used for transporting agricultural workers shall be equipped with first-aid equipment as specified in WAC 296-306-050, including two blankets and an approved fire extinguisher.

Note: When more than one vehicle is located at a station, one equipped vehicle shall meet the intent of this section.

(7) No heating units in which there are open flames or catalytic action shall be used in vehicles transporting crews.

[Order 75-2, § 296-306-160, filed 1/24/75.]

**WAC 296-306-165 General requirements for all agricultural equipment. (1) Definitions.**

(a) "Agricultural equipment" means equipment used in production or handling of agricultural products.

(b) "Agricultural field equipment" means tractors, self-propelled implements, implements and combinations thereof used in agricultural operations.

(c) "Agricultural tractor" means a two-wheel or four-wheel drive type vehicle, or a track vehicle, of more than twenty net engine horsepower (continuous brake power rating per Society of Automotive Engineers (SAE) J816b - or the power recommended by the manufacturer for satisfactory operation under the manufacturer specified continuous duty conditions), designed to furnish the power to pull, carry, propel, or drive implements that are designed for agriculture. All self-propelled implements are excluded.

(d) "Augers" means screw conveyors and related accessories designed primarily for conveying agricultural materials on farms.

(e) "Constant-running drives" means those drives which continue to rotate when the engine is running. (With all clutches disengaged.)

(f) "Farm field equipment" means tractors or implements, including self-propelled implements, or any combination thereof used in agricultural operations.

(g) "Farmstead equipment" means agricultural equipment normally used in a stationary manner. This includes, but is not limited to, materials handling equipment and accessories for such equipment whether or not the equipment is an integral part of a building.

(h) "Guarding by location" means a component may be considered guarded by location when, because of its location, it does not present a hazard during operation or maintenance. A component seven feet or more above a working surface is considered guarded by location.

(i) "Ground-drive equipment" means equipment using power supplied by its pulled wheels to move gears, chains, sprockets, belts, pulleys, augers, tines, etc.

(j) "Low profile tractor" means a wheel or track equipped vehicle possessing the following characteristics:

(i) The front wheel spacing is equal to the rear wheel spacing, as measured from the centerline of each right wheel to the centerline of the corresponding left wheel; or rear wheel spacing may be increased to gain stability, but in no instance shall the front wheel spacing be less than shown in Table I.

TABLE I

HORSEPOWER	MINIMUM SPAN
20 - 30	48 Inches
31 - 40	50 Inches
41 - 50	52 Inches
51 - 60	54 Inches
61 - 70	56 Inches
71 and Over	60 Inches

(ii) The clearance from the bottom of the tractor chassis to the ground does not exceed eighteen inches.

(iii) The highest point of the hood does not exceed sixty inches, and

(iv) The tractor is designed so that the operator straddles the transmission when seated.

(k) A "guard" or "shield" is a barrier which insures that no part of an employee may come into contact with a hazard created by a moving machinery part.

(l) "Power take-off shafts" are the shafts and knuckles between the tractor, or other power source, and the first gear set, pulley, sprocket, or other components on power takeoff shaft driven equipment.

(2) Immediate priority shall be given to guarding of power take-off drives on all tractors and equipment. These must be guarded no later than January 1, 1976.

(3) All other power transmission components must be guarded on all equipment manufactured on or after January 1, 1976.

(4) If unguarded power transmission components on older field equipment show evidence that they were once guarded, the guards shall be replaced by January 1, 1976.

(5) The manufacturer's instruction manual, if published by the manufacturer and currently available, shall be the source of information for the safe operation and maintenance of field equipment.

(6) Operating instructions. At the time of initial assignment and at least annually thereafter, the employer shall instruct every employee in the safe operation and servicing of all covered equipment with which he is or will be involved, including at least the following safe operating practices:

(a) Keep all guards in place when the machine is in operation;

(b) Passengers, other than persons required for instruction or machine operation shall not be permitted to ride on equipment unless a passenger seat or other protective device is provided.

(c) Stop engine, disconnect the power source, and wait for all machine movement to stop before servicing, adjusting, cleaning, or unclogging the equipment, except where the machine must be running to be properly serviced or maintained, in which case the employer shall instruct employees as to all steps and procedures which



are necessary to safely service or maintain the equipment;

(d) Make sure everyone is clear of machinery before starting the engine, engaging power, or operating the machine;

(e) Lock out electrical power before performing maintenance or service on farmstead equipment.

(7) Methods of guarding. Except as otherwise provided in this chapter, each employer shall protect employees from coming into contact with moving machinery parts as follows:

(a) Through the installation and use of a guard or shield or guarding by location;

(b) Whenever a guard or shield or guarding by location is infeasible, by using a guardrail or fence.

(8) Strength and design of guards.

(a) Where guards are used to provide the protection required by this section, they shall be designed and located to prevent inadvertent contact with the hazard being guarded.

(b) Unless otherwise specified, each guard and its supports shall be capable of withstanding the force that a two hundred fifty pound individual, leaning on or falling against the guard, would exert upon that guard.

(c) Guards shall be free from burrs, sharp edges, and sharp corners, and shall be securely fastened to the equipment or building.

(9) Guarding by railings. Guardrails or fences shall be capable of preventing employees from inadvertently entering the hazardous area.

(10) Servicing and maintenance. Whenever a moving machinery part presents a hazard during servicing or maintenance, the engine shall be stopped, the power source disconnected, and all machine movement stopped before servicing or maintenance is performed, except where the employer can establish that:

(a) The equipment must be running to be properly serviced or maintained;

(b) The equipment cannot be serviced or maintained while a guard or guards are in place; and

(c) The servicing or maintenance is safely performed.

(11) Shields, guards and access doors that will prevent accidental contact with rotating machine parts on constant-running drives shall be in place when the machine is running. This requirement shall not apply to combines where such guards could create fire hazards.

(12) A guard or shield on stationary equipment shall be provided at the mesh point or pinch point where the chain or belt contacts the sprocket or pulley. Revolving shafts shall be guarded by a standard safeguard unless guarded by location. Shafts that protrude less than one-half the outside diameter of the shaft are exempt from this section.

(13) Projections, such as exposed bolts, keys, or set screws on sprockets, sheaves or pulleys on stationary equipment shall be shielded unless guarded by location.

[Statutory Authority: Chapter 49.17 RCW. 89-11-035 (Order 89-03), § 296-306-165, filed 5/15/89, effective 6/30/89; Order 76-28, § 296-306-165, filed 9/28/76; Order 75-2, § 296-306-165, filed 1/24/75.]

**WAC 296-306-170 Auger conveying equipment.** (1) Scope. This section applies only to farm augers as defined in WAC 296-306-165 (1)(e).

(2) General specifications.

(a) All shields and guards shall conform to WAC 296-306-165(13).

(b) Power take off shaft guards shall conform to WAC 296-306-165(8).

(3) Specifications.

(a) Each sweep auger shall have its top half shielded by a guard. No opening in such guard shall exceed 4 3/4 inches in length or width.

(b) The exposed auger at the hopper and the intake shall be guarded or otherwise designed to provide a deterrent from accidental contact with the rotating inlet area and extend a minimum of 2 1/2 inches above and below the exposed auger. Openings in the guard, for the free flow of material, shall not exceed 4 3/4 inches in length or width and shall be of sufficient strength to support a concentrated weight of 250 pounds at mid span.

(c) The hand raising winch shall be provided with a control which will hold the auger at any angle of inclination, and respond only to handle actuation. It shall not be necessary to disengage such control to lower the auger. The force required on the handle to raise or lower the auger manually shall not exceed 50 pounds.

(d) The wire rope lifting pulleys shall be grooved to fit the wire rope with which they are used.

(e) In order to avoid separation, a positive restraint shall be provided between the auger tube and the under-carriage lifting arm. Stops that restrict the maximum raised angle and minimum lowered angle shall be provided.

(f) Wire ropes (cables) shall be rust resistant and selected for the design load and service intended.

(g) Service and operation instructions provided the equipment operator shall include those basic practices for safe operation and servicing.

(4) All augers shall be covered or guarded when exposed to contact.

(5) Equipment manufactured after October 25, 1976, shall be guarded in compliance with the following specification:

(a) Sweep arm material gathering mechanisms used on the top surface of materials within silo structures shall be guarded. The lower or leading edge of the guard shall be located no more than 12 inches above the material surface and no less than 6 inches in front of the leading edge of the rotating member of the gathering mechanism. The guard shall be parallel to, and extend the fullest practical length of the material gathering mechanism.

(b) Exposed auger flighting on portable grain augers shall be guarded with either grating type guards or solid baffle style covers as follows:

(i) The largest dimensions or openings in grating type guards through which materials are required to flow shall be 4 3/4 inches. The area of each opening shall be no larger than 10 square inches. The opening shall be



located no closer to the rotating flighting than 2 1/2 inches.

(ii) Slotted openings in solid baffle style covers shall be no wider than 1 1/2 inches, or closer than 3 1/2 inches to the exposed flighting.

[Order 76-28, § 296-306-170, filed 9/28/76; Order 75-2, § 296-306-170, filed 1/24/75.]

**WAC 296-306-175 Farm field equipment guarding.**

**(1) Power takeoff guarding.**

(a) All power takeoff shafts, including rear, mid- or side-mounted shafts, shall be guarded either by a master shield, as provided in item (1)(b) of this subdivision, or by other protective guarding.

(b) All tractors shall be equipped with an agricultural tractor master shield on the rear power takeoff except where removal of the tractor master shield is permitted by item (1)(c) of this subdivision. The master shield shall have sufficient strength to prevent permanent deformation of the shield when a 250 pound operator mounts or dismounts the tractor using the shield as a step.

(c) Power takeoff driven equipment shall be guarded to prevent employee contact with positively driven rotating members of the power drive system. Where power takeoff driven equipment is of a design requiring removal of the tractor master shield, the equipment shall also include protection from that portion of the tractor power takeoff shaft which protrudes from the tractor.

(d) Signs shall be placed at prominent locations on tractors and power takeoff driven equipment specifying that power drive system safety shields must be kept in place.

**(2) Other power transmission components.**

(a) The mesh or nip-points of all power driven gears, belts, chains, sheaves, pulleys, sprockets and idlers shall be guarded.

(b) All revolving shafts, including projections such as bolts, keys or set screws, shall be guarded, except smooth shaft ends protruding less than one-half the outside diameter of the shaft and its locking means.

(c) Ground driven components shall be guarded in accordance with items (2)(i)[(2)(a)] and (2)(ii)[(2)(b)] of this subdivision if any employee may be exposed to them while the drives are in motion.

(3) Functional components, such as snapping or husking rolls, straw spreaders and choppers, cutterbars, flail rotors, rotary beaters, mixing augers, feed rolls, conveying augers, rotary tillers, and similar units which must be exposed for proper function shall be shielded to a degree consistent with the intended function and operator's vision of the component.

(4) Access to moving parts. Where removal of a guard or access door will expose an employee to any component which continues to rotate after the power is disengaged, the employer shall provide, in the immediate area, the following:

(a) A safety sign warning the employee to:

(i) Look and listen for evidence of rotation; and

(ii) Not remove the guard or access door until all components have stopped; and

(iii) On equipment manufactured after October 25, 1976, a readily visible or audible warning of rotation.

(5) If the mounting steps or ladder and the handholds of the propelling vehicle are made inaccessible by installation of other equipment, other steps and handholds shall be provided on the equipment.

(6) A slip-resistant means or material shall be provided on the operator's steps and platform to minimize the possibility of feet slipping.

(7) Ground-drive equipment shall be shielded or guarded as specified in WAC 296-306-165(12) if operators are exposed to drives while they are in motion.

[Order 76-28, § 296-306-175, filed 9/28/76.]

**WAC 296-306-180 Farmstead equipment. (1) Power takeoff guarding.**

(a) All power takeoff shafts, including rear, mid- or side-mounted shafts, shall be guarded either by a master shield as provided in WAC 296-306-175 (1)(b) or other protective guarding.

(b) Power takeoff driven equipment shall be guarded to prevent employee contact with positively driven rotating members of the power drive system. Where power takeoff driven equipment is of a design requiring removal of the tractor master shield, the equipment shall also include protection from that portion of the tractor power takeoff shaft which protrudes from the tractor.

(c) Signs shall be placed at prominent locations on power takeoff driven equipment specifying that power drive system safety shields must be kept in place.

**(2) Other power transmission components.**

(a) The mesh or nip-points of all power driven gears, belts, chains, sheaves, pulleys, sprockets and idlers shall be guarded.

(b) All revolving shafts, including projections such as bolts, keys, or set screws, shall be guarded, with the exception of:

(i) Smooth shafts and shaft ends (without any projecting bolts, keys, or set screws), revolving at less than 10 rpm, on feed handling equipment used on the top surface of materials in bulk storage facilities; and

(ii) Smooth shaft ends protruding less than one-half the outside diameter of the shaft and its locking means.

(3) Functional components, such as snapping or husking rolls, straw spreaders and choppers, cutterbars, flail rotors, rotary beaters, mixing augers, feed rolls, conveying augers, rotary tillers and similar units, which must be exposed for proper function shall be shielded to a degree consistent with the intended function and operator's vision of the component.

**(4) Access to moving parts.**

(a) Guards, shields and access doors shall be in place when the equipment is in operation.

(b) Where removal of a guard or access door will expose an employee to any component which continues to rotate after the power is disengaged, the employer shall provide, in the immediate area, the following:

(i) A safety sign warning the employee to:

(A) Look and listen for evidence of rotation; and

(B) Not remove the guard or access door until all components have stopped; and

(C) On equipment manufactured after October 25, 1976, a readily visible or audible warning of rotation.

[Order 76-28, § 296-306-180, filed 9/28/76.]

## PART L--ROLLOVER PROTECTIVE STRUCTURES (ROPS) FOR TRACTORS USED IN AGRICULTURE AND INDUSTRY

**WAC 296-306-200 Rollover protective structures (ROPS) for tractors used in agricultural operations.** (1) Scope. Agricultural tractors manufactured after October 25, 1976, shall meet the requirements in this section.

Note: The promulgation of specific standards for rollover protective structures for rubber-tired skid-steer equipment is reserved pending promulgation of specific standards to cover such equipment. ROPS requirements contained in this section do not apply to rubber-tired skid-steer equipment used in agricultural operations.

(2) Rollover protective structure. A rollover protective structure (ROPS) shall be provided by the employer for each tractor operated by an employee. Except as provided in subsection (6) of this section, ROPS used on wheel-type tractors shall meet the test and performance requirements of WAC 296-306-250 through 296-306-25023 and ROPS used on track-type tractors shall meet the test and performance requirements of WAC 296-306-260 through 296-306-270. (See ROPS Design and Testing Criteria Addendum.)

### (3) Seatbelts.

(a) Where ROPS are required by this section, the employer shall:

(i) Provide each tractor with a seatbelt which meets the requirements of this subsection;

(ii) Require that each employee uses such seatbelt while the tractor is moving; and

(iii) Require that each employee tightens the seatbelt sufficiently to confine the employee to the protected area provided by the ROPS.

(b) Each seatbelt shall meet the requirements set forth in Society of Automotive Engineers Standard SAE J4C, 1965 Motor Vehicle Seat Belt Assemblies,\* except as noted hereafter:

(i) Where a suspended seat is used, the seatbelt shall be fastened to the movable portion of the seat to accommodate a ride motion of the operator.

(ii) The seatbelt anchorage shall be capable of withstanding tensile loading as required by WAC 296-306-275 (1) and (2).

(iii) The seatbelt webbing material shall have a resistance to acids, alkalis, mildew, aging, moisture and sunlight equal to or better than that of untreated polyester fiber.

(4) Protection from spillage. Batteries, fuel tanks, oil reservoirs and coolant systems shall be constructed and located or sealed to assure that spillage will not occur which may come in contact with the operator in the event of an upset.

(5) Protection from sharp surfaces. All sharp edges and corners at the operator's station shall be designed to minimize operator injury in the event of an upset.

(6) Exempted uses. Subsections (2) and (3) of this section do not apply to the following uses:

(a) "Low profile" tractors while they are used in orchards, vineyards or hop yards where the vertical clearance requirements would substantially interfere with normal operations, and while their use is incidental to the work performed therein.

(b) "Low profile" tractors while used inside a farm building or greenhouse in which the vertical clearance is insufficient to allow a ROPS equipped tractor to operate, and while their use is incidental to the work performed therein.

(c) Tractors while used with mounted equipment which is incompatible with ROPS (e.g., cornpickers, cotton strippers, vegetable pickers and fruit harvesters.)

(d) Track-type agricultural tractors whose overall width (as measured between the outside edges of the tracks) is at least three times the height of their rated center of gravity, and whose rated maximum speed in either forward or reverse is not greater than seven miles per hour, when used only for tillage or harvesting operations and while their use is incidental thereto, and which:

(i) Does not involve operating on slopes in excess of forty percent from horizontal; and

(ii) Does not involve operating on piled crop products or residue, as for example, silage in stacks or pits, and

(iii) Does not involve operating in close proximity to irrigation ditches, streams or other excavations more than two feet deep which contain slopes of more than forty percent from horizontal; and

(iv) Does not involve construction-type operation, such as bulldozing, grading or land clearing.

(7) Remounting. Where ROPS are removed for any reason, they shall be remounted so as to meet the requirements of this subsection.

(8) Labeling. Each ROPS shall have a label, permanently affixed to the structure, which states:

(a) Manufacturer's or fabricator's name and address;

(b) ROPS model number, if any;

(c) Tractor makes, models, or series numbers that the structure is designed to fit; and

(d) That the ROPS model was tested in accordance with the requirements of this section.

(9) Operating instructions. Every employee who operates an agricultural tractor shall be informed of the operating practices contained in Exhibit A of this section and of any other practices dictated by the work environment. Such information shall be provided at the time of initial assignment and at least annually thereafter.

\*Copies may be obtained from the Society of Automotive Engineers, 400 Commonwealth Drive, Warrendale, PA 15096.

### EXHIBIT A

#### EMPLOYEE OPERATING INSTRUCTIONS

1. Securely fasten your seat belt if the tractor has a ROPS.
2. Where possible, avoid operating the tractor near ditches, embankments and holes.
3. Reduce speed when turning, crossing slopes and on rough, slick or muddy surfaces.
4. Stay off slopes too steep for safe operation.

5. Watch where you are going, especially at row ends, on roads and around trees.
6. Passengers, other than persons required for instruction or machine operation, shall not be permitted to ride on equipment unless a passenger seat or other protective device is provided.
7. Operate the tractor smoothly—no jerky turns, starts, or stops.
8. Hitch only to the drawbar and hitch points recommended by tractor manufacturers.
9. When tractor is stopped, set brakes securely and use park lock if available.

Note: See Number LI-414-28.

[Statutory Authority: Chapter 49.17 RCW. 89-11-035 (Order 89-03), § 296-306-200, filed 5/15/89, effective 6/30/89. Statutory Authority: RCW 49.17.040 and 49.17.050. 83-15-017 (Order 83-19), § 296-306-200, filed 7/13/83, effective 9/12/83; 82-08-026 (Order 82-10), § 296-306-200, filed 3/30/82; Order 76-28, § 296-306-200, filed 9/28/76.]

**WAC 296-306-250 Protective frames for wheel-type agricultural tractors—Test procedures and performance requirements—Purpose.** The purpose of this section is to establish the test and performance requirements for a protective frame designed for wheel-type agricultural tractors to minimize the frequency and severity of operator injury resulting from accidental upsets. General requirements for the protection of operators are specified in WAC 296-306-200.

[Order 76-28, § 296-306-250, filed 9/28/76.]

**WAC 296-306-25003 Types of tests.** All protective frames for wheel type agricultural tractors shall be of a model which has been tested as follows:

(1) Laboratory test. A laboratory energy absorption test, either static or dynamic, under repeatable and controlled loading, to permit analysis of the protective frame for compliance with the performance requirements of this standard.

(2) Field upset test. A field upset test under controlled conditions, both to the side and rear, to verify effectiveness of the protective system under actual dynamic conditions. Such test may be omitted where:

(a) The analysis of the protective frame static energy absorption test results indicates that both FERis and FERir (as defined in WAC 296-306-25007 (2)(b), exceed 1.15; or

(b) The analysis of the protective frame dynamic energy absorption test results indicate that the frame can withstand an impact of 15 percent greater than the impact it is required to withstand for the tractor weight as shown in Figure C-7 [WAC 296-306-25095].

[Order 76-28, § 296-306-25003, filed 9/28/76.]

**WAC 296-306-25005 Description.** (1) Protective frame. A protective frame is a structure comprised of uprights mounted to the tractor, extending above the operator's seat. A typical 2-post frame is shown in Figure C-1. (Figures C-1 through C-16 are contained in Exhibit B [WAC 296-306-25095].)

(1989 Ed.)

(2) Overhead weather shield. If an overhead weather shield is available for attachment to the protective frame, it may be in place during tests provided it does not contribute to the strength of the protective frame.

(3) Overhead falling object protection. If an overhead falling object protection device is available for attachment to the protective frame, it may be in place during tests provided it does not contribute to the strength of the protective frame.

[Order 76-28, § 296-306-25005, filed 9/28/76.]

**WAC 296-306-25007 Test procedures.** (1) General.

(a) The tractor weight used shall be that of the heaviest tractor model on which the protective frame is to be used.

(b) Each test required under this section shall be performed on a new protective frame. Mounting connections of the same design shall be used during each such test.

(c) Instantaneous deflection shall be measured and recorded for each segment of the test. See WAC 296-306-25009 (1)(a) for permissible deflection.

(d) Seat reference point (SRP) in Fig. C-3 is that point where the vertical line that is tangent to the most forward point at the longitudinal seat centerline of the seat back, and the horizontal line that is tangent to the highest point of the seat cushion intersect in the longitudinal seat section. The seat reference point shall be determined with the seat unloaded and adjusted to the highest and most rearward position provided for seated operation of the tractor.

(e) Where the centerline of the seat is off the longitudinal center, the frame loading shall be on the side with the least space between the centerline of seat and the protective frame.

(f) Low temperature characteristics of the protective frame or its material shall be demonstrated as specified in WAC 296-306-25009 (1)(b).

(g) Rear input energy tests (static, dynamic, or field upset) need not be performed on frames mounted to tractors having 4 driven wheels and more than one-half their unballasted weight on the front wheels.

(h) Accuracy table:

Measurements	Accuracy
Deflection of frame, inches (millimeters) . . . . .	± 5 percent of deflection measured.
Vehicle weight, pounds (kilograms) . . . . .	± 5 percent of the weight measured.
Force applied to frame, pounds force (newtons) . . . . .	± 5 percent of force measured.
Dimensions of critical zone, inches (millimeters) . . . . .	± 0.5 inch (12.5 millimeters).

(2) Static test procedure.

(a) The following test conditions shall be met:

(i) The laboratory mounting base shall be the tractor chassis for which the protective frame is designed, or its equivalent.

(ii) The protective frame shall be instrumented with the necessary equipment to obtain the required load deflection data at the locations and directions specified in Fig. C-2 and C-3.

(iii) If the protective frame is of a one or two upright design, mounting connections shall be instrumented with the necessary equipment to record the required force to be used in subsection (2)(c)(v) and (x) of this section. Instrumentation shall be placed on mounting connections before installation load is applied.

(b) The following definitions shall apply:

W = Tractor weight includes the protective frame or enclosure, all fuels, and other components required for normal use of the tractor. Ballast shall be added as necessary to achieve a minimum total weight of 110 pounds (50.0 kg.) per maximum power takeoff horsepower at the rated engine speed or the maximum gross vehicle weight specified by the manufacturer, whichever is the greatest. Front end weight shall be at least 25 percent of the tractor test weight. In case power takeoff horsepower is not available, 95 percent of net engine flywheel horsepower shall be used.

E<sub>is</sub> = Energy input to be absorbed during side loading in ft-lb (E'<sub>is</sub> in m-kg.).

$E_{is} = 723 + 0.4 W$  (E'<sub>is</sub> = 100 + 0.12 W').

E<sub>ir</sub> = Energy input to be absorbed during rear loading in ft-lb (E'<sub>ir</sub> in m-kg.).

$E_{ir} = 0.47 W$  (E'<sub>ir</sub> = 0.14 W').

L = Static load, lbf [pounds force], (N) [newtons].

D = Deflection under L, in. (mm).

L-D = Static load-deflection diagram.

L<sub>max</sub> = Maximum observed static load.

Load

Limit = Point on a continuous L-D curve where observed static load in 0.8 L<sub>max</sub> on down slope of curve (refer to Fig. C-5).

E<sub>u</sub> = Strain energy absorbed by the frame, ft-lb (m-kg). Area under L-D curve.

FER = Factor of energy ratio.

E<sub>u</sub>

$FER_{is} = \frac{E_u}{E_{is}}$

E<sub>u</sub>

$FER_{ir} = \frac{E_u}{E_{ir}}$

E<sub>ir</sub>

P<sub>b</sub> = Maximum observed force in mounting connection under static load, L lbf(N).

P<sub>u</sub> = Ultimate force capacity of mounting connection, lbf(N).

FSB = Design margin for mounting connection.

P<sub>u</sub>

$FSB = \frac{P_u}{P_b}$

P<sub>b</sub>

(c) The test procedures shall be as follows:

(i) Apply the rear load in accordance with Fig. C-3 and record L and D simultaneously. Rear load application shall be uniformly distributed on the frame over an area perpendicular to the direction of load application, no greater than 160 square inches (1032 sq. cm.) in size, with the largest dimension no greater than 27 inches (686 mm). The load shall be applied to the upper extremity of the frame at the point which is midway between the center of the frame and the inside of the frame upright. If no structural cross member exists at the rear of the frame, a substitute test beam which does not add strength to the frame may be utilized to complete this test procedure. The test shall be stopped when:

(A) The strain energy absorbed by the frame is equal to or greater than the required input energy E<sub>ir</sub> or;

(B) Deflection of the frame exceeds the allowable deflection (see WAC 296-306-25009 (1)(a)), or

(C) Frame load limit (see Figure C-5) occurs before the allowable deflection is reached in rear load.

(ii) Using data obtained in subsection (2)(c)(i) of this section, construct the L-D diagram as shown typically in Fig. C-5.

(iii) Calculate E<sub>ir</sub>.

(iv) Calculate FER<sub>ir</sub>.

(v) Calculate FSB where required by subsection (2)(a)(iii) of this section.

(vi) Apply the side load tests on the same frame and record L and D simultaneously. Side load application shall be at the upper extremity of the frame at a 90 degree angle to the center line of the vehicle. The side load shall be applied to the longitudinal side farthest from the point of rear load application. Apply side load L as shown in Fig. C-2. The test shall be stopped when:

(A) The strain energy absorbed by the frame is equal to or greater than the required input energy E<sub>is</sub> or;

(B) Deflection of the frame exceeds the allowable deflection (see WAC 296-306-25009 (1)(a)) or;

(C) Frame load limit (see Figure C-5) occurs before the allowable deflection is reached in side load.

(vii) Using data obtained in subsection (2)(c)(vi) of this section, construct the L-D diagram as shown typically in Fig. C-5.

(viii) Calculate E<sub>is</sub>.

(ix) Calculate FER<sub>is</sub>.

(x) Calculate FSB where required by subsection (2)(a)(iii) of this section.

(3) Dynamic test procedure.

(a) The following test conditions shall be met:

(i) The protective frame and tractor shall be tested at the weight as defined in WAC 296-306-25007 (2)(b).

(ii) The dynamic loading shall be accomplished by use of a 4410 lb. (2000 KG) weight acting as a pendulum. The impact face of the weight shall be 27 ± 1 inch by 27 ± 1 inch (686 ± 25 mm by 686 ± 25 mm) and shall be constructed so that its center of gravity is within 1 inch (25.4 mm) of its geometric center. The weight shall be suspended from a pivot point 18 to 22 feet (5.5-6.7 m) above the point of impact on the frame and shall be conveniently and safely adjustable for height (see Fig. C-6).

(iii) For each phase of testing, the tractor shall be restrained from moving when the dynamic load is applied. The restraining members shall have strength no less than, and elasticity no greater than, that of 0.50 inches (12.7 mm) steel cable. Points of attachment of restraining members shall be located an appropriate distance behind the rear axle and in front of the front axle to provide a 15 to 30 degree angle between a restraining cable and the horizontal. For the impact from the rear, the restraining cable shall be located in the plane in which the center of gravity of the pendulum will swing, or alternatively, two sets of symmetrically located cables may be used at lateral locations on the tractor. For impact from the side, restraining cables shall be used as shown in Figures C-8 and C-9.

(iv) The front and rear wheel tread settings, where adjustable, shall be at the position nearest to halfway between the minimum and maximum settings obtainable on the vehicle. Where only two settings are obtainable, the minimum setting shall be used. The tires shall have no liquid ballast and shall be inflated to the maximum operating pressure recommended by the manufacturer. With specified tire inflation, the restraining cable shall be tightened to provide tire deflection of 6 to 8 percent of nominal tire section width. After the vehicle is properly restrained, a wooden beam no less than 6 x 6 inches (150 x 150 mm) cross section shall be driven tightly against the appropriate wheels and clamped. For the test to the side, an additional wooden beam shall be placed as a prop against the wheel nearest the operator's station and shall be secured to the base so that it is held tightly against the wheel rim during impact. The length of this beam shall be chosen so that it is at an angle of 25 to 40 degrees to the horizontal when it is positioned against the wheel rim. It shall have a length 20 to 25 times its depth and a width 2 to 3 times its depth. (See Figs. C-8 and C-9.)

(v) Means shall be provided for indicating the maximum instantaneous deflection along the line of impact. A simple friction device is illustrated in Fig. C-4.

(vi) No repairs or adjustments shall be made during the test.

(vii) If any cables, props, or blocking shift or break during the test, the test shall be repeated.

(b) H = Vertical height of center of gravity of 4410 pounds (2000 kg) weight in inches (H' in mm). The weight shall be pulled back so that the height of its center of gravity above the point of impact is:

$$H = 4.92 + 0.00190 W \text{ or } H' = 125 + 0.170 W'$$

(Fig. C-7).

(c) The test procedures shall be as follows:

(i) The frame shall be evaluated by imposing dynamic loading from the rear followed by a load to the side on the same frame. The pendulum swinging from the height determined by subsection (3)(b) of this section shall be used to impose the dynamic load. The position of the pendulum shall be so selected that the initial point of impact on the frame is in line with the arc of travel of the center of gravity of the pendulum. Where a quick

release mechanism is used, it shall not influence the attitude of the block.

(ii) Impact at rear: The tractor shall be properly restrained in accordance with subsection (3)(a)(iii) and (3)(a)(iv) of this section. The tractor shall be positioned with respect to the pivot point of the pendulum so that the pendulum is 20 degrees from the vertical prior to impact as shown in Fig. C-8. The impact shall be applied to the upper extremity of the frame at the point which is midway between the center line of the frame and the inside of the frame upright. If no structural cross member exists at the rear of the frame, a substitute test beam which does not add to the strength of the frame may be utilized to complete the procedure.

(iii) Impact at side: The blocking and restraining shall conform to subsection (3)(a)(iii) and (3)(a)(iv) of this section. The point of impact shall be at the upper extremity of the frame at a point most likely to hit the ground first and at a 90 degree angle to the center line of the vehicle as shown in Fig. C-9. The side impact shall be applied to the longitudinal side farthest from the point of rear impact.

(4) Field upset test procedure.

(a) The following test conditions shall be met:

(i) The tractor shall be tested at the weight as defined in WAC 296-306-25007 (2)(b).

(ii) The test shall be conducted on a dry, firm soil bank. The soil in the impact area shall have an average cone index in the 0 to 6 inch (0 to 152 mm) layer of not less than 150. Cone index shall be determined in accordance with American Society of Agricultural Engineers Recommendation ASAE R313.1, Soil Cone Penetrometer (1971).\* The path of vehicle travel shall be  $12 \pm 2$  degrees to the top edge of the bank.

(iii) An 18 inch (457 mm) high ramp as described in Fig. C-10 shall be used to assist in upsetting the vehicle to the side.

(iv) The front and rear wheel tread settings, where adjustable, shall be at the position nearest to halfway between the minimum and maximum settings obtainable on the vehicle. Where only two settings are obtainable, the minimum setting shall be use.

(b) Field upsets shall be induced to the rear and side.

(i) Rear upset shall be induced by engine power with the tractor operating in a gear to obtain 3 to 5 miles per hour (4.8 to 8.0 km per hour) at maximum governed engine rpm by driving forward directly up a minimum slope of  $60^\circ \pm 5^\circ$  as shown in Fig. C-11 or by an alternative equivalent means. The engine clutch may be used to aid in inducing the upset.

(ii) To induce side upset, the tractor shall be driven under its own power along the specified path of travel at a minimum speed of 10 miles per hour (16 km per hour), or at maximum vehicle speed if under 10 miles per hour (16 km per hour), and over the ramp as described in subsection (4)(a)(iii) of this section.

[Order 76-28, § 296-306-25007, filed 9/28/76.]

Reviser's note: Exhibit B, Figures C-1 through C-16, is codified as WAC 296-306-25095.

**WAC 296-306-25009 Performance requirements.**

(1) General requirements. (a) The frame, overhead weather shield, fenders, or other parts in the operator area may be deformed in these tests but shall not shatter or leave sharp edges exposed to the operator, or encroach on the dimensions shown in Figs. C-2 and C-3 [WAC 296-306-25095] as follows:

- d = 2 inch (51 mm) inside of frame upright to vertical center line of seat.
- e = 30 inch (762 mm) at the longitudinal centerline.
- f = Not greater than 4 inches (102 mm) to rear edge of crossbar, measured forward of the seat reference point (SRP).
- g = 24 inch (610 mm) minimum.
- m = Not greater than 12 inch (305 mm) measured from SRP to forward edge of crossbar.

(b) The protective structure and connecting fasteners must pass the static or dynamic tests described in subsection (2), (3) or (4) of this section at a metal temperature of 0 degrees fahrenheit or below, or exhibit Charpy V-notch impact strengths as follows:

- 10 mm x 10 mm specimen: 8 ft.-lb at -20° F.
- 10 mm x 7.5 mm specimen: 7 ft.-lb at -20° F.
- 10 mm x 5 mm specimen: 5.5 ft.-lb at -20° F.
- 10 mm x 2.5 mm specimen: 4 ft.-lb at -20° F.

Specimens shall be longitudinal and taken from flat stock, tubular, or structural sections before forming or welding for use in the frame. Specimens from tubular or structural sections shall be taken from the middle of the side of greatest dimension, not to include welds.

(2) Static test performance requirements. In addition to meeting the requirements of WAC 296-306-25009(1) in both side and rear loads, FERis and FERir shall be greater than 1, and where the ROPS contains 1 or 2 upright frames only, FSB shall be greater than 1.3.

(3) Dynamic test performance requirements. The structural requirements will be met where the dimensions in WAC 296-306-25009(1) are adhered to in both side and rear loads.

(4) Field upset test performance requirements. The requirements of WAC 296-306-25009(1) shall be met in both side and rear upsets.

[Order 76-28, § 296-306-25009, filed 9/28/76.]

**WAC 296-306-25013 Protective enclosures for wheel type agricultural tractors--Test procedures and performance requirements--Purpose.** The purpose of this section is to establish the test and performance requirements for a protective enclosure designed for wheel-type agricultural tractors to minimize the frequency and severity of operator injury resulting from accidental upset. General requirements for the protection of operators are specified in WAC 296-306-200.

[Order 76-28, § 296-306-25013, filed 9/28/76.]

[Title 296 WAC--p 2220]

**WAC 296-306-25017 Types of tests.** All protective enclosures for wheel type agricultural tractors shall be of a model which has been tested as follows:

(1) Laboratory test. A laboratory energy absorption test, either static or dynamic, under repeatable and controlled loading to permit analysis of the protective enclosure for compliance with the performance requirements of this standard.

(2) Field upset test. A field upset test under controlled conditions, both to the side and rear, to verify effectiveness of the protective system under actual dynamic conditions. This test may be omitted where:

(a) The analysis of the protective frame static energy absorption test results indicate that both FERis and FERir (as defined in WAC 296-306-25021 (2)(b) exceed 1.15, or

(b) The analysis of the protective frame dynamic energy absorption test results indicate that the frame can withstand an impact 15 percent greater than the impact it is required to withstand for the tractor weight as shown in Fig. C-7 [WAC 296-306-25095].

[Order 76-28, § 296-306-25017, filed 9/28/76.]

**WAC 296-306-25019 Description.** A protective enclosure is a structure comprising a frame and/or enclosure mounted to the tractor. A typical enclosure is shown in Figure C-12 [WAC 296-306-25095].

[Order 76-28, § 296-306-25019, filed 9/28/76.]

**WAC 296-306-25021 Test procedures. (1) General.**

(a) The tractor weight used shall be that of the heaviest tractor model on which the protective enclosure is to be used.

(b) Each test required under this section shall be performed on a protective enclosure with new structural members. Mounting connections of the same design shall be used during each test.

(c) Instantaneous deflection shall be measured and recorded for each segment of the test. See WAC 296-306-25023 (1)(a) for permissible deflection.

(d) Seat reference point (SRP) (in Fig. C-14) is that point where the vertical line that is tangent to the most forward point at the longitudinal seat centerline of the seat back, and the horizontal line that is tangent to the highest point of the seat cushion intersect in the longitudinal seat section. The seat reference point shall be determined with the seat unloaded and adjusted to the highest and most rearward position provided for seated operations of the tractor.

(e) Where the centerline of the seat is off the longitudinal center, the protective enclosure loading shall be on the side with least space between the centerline of the seat and the protective enclosure.

(f) Low temperature characteristics of the protective enclosure or its material shall be demonstrated as specified in WAC 296-306-25023 (1)(b).

(g) Rear input energy tests (static, dynamic, or field upset) need not be performed on enclosures mounted to tractors having 4 driven wheels and more than one-half their unballasted weight on the front wheels.

(h) Accuracy table:



Measurements	Accuracy
Deflection of enclosure, . . . . . inches (millimeters)	$\pm 5$ percent of deflection measured.
Vehicle weight, pounds . . . . . (kilograms)	$\pm 5$ percent of the weight measured.
Force applied to frame, pounds . . . . . force (newtons)	$\pm 5$ percent of force measured.
Dimensions of critical zone, . . . . . inches (millimeters)	$\pm 0.5$ inch (12.5 millimeters).

(i) Where movable or normally removable portions of the enclosure add to structural strength, they shall be placed in configurations that contribute least to the structural strength during the test.

(2) Static test procedure.

(a) The following test conditions shall be met:

(i) The laboratory mounting base shall be the tractor chassis for which the protective enclosure is designed or its equivalent.

(ii) The protective enclosure shall be instrumented with the necessary equipment to obtain the required load deflection data at the locations and directions as specified in Figs. C-13 and C-14.

(b) The following definitions shall apply:

W = Tractor weight (see WAC 296-306-25007 (2)(b) in lb.(W' in kg.).

E<sub>is</sub> = Energy input to be absorbed during side loading in ft-lb(E'is in m-kg.).

E<sub>is</sub> = 723 + 0.4W (E'is = 100 + 0.12 W').

E<sub>ir</sub> = Energy input to be absorbed during rear loading in ft-lb(E'ir in m-kg.).

E<sub>ir</sub> = 0.47 W (E'ir = 0.14W').

L = Static load, lbf(N).

D = Deflection under L, in.(mm).

L-D = Static load-deflection diagram.

L<sub>max</sub> = Maximum observed static load.

Load

Limit = Point on a continuous L-D curve where observed static load is 0.8 L<sub>max</sub> on down slope of curve (refer to Fig. C-5).

E<sub>u</sub> = Strain energy absorbed by the frame, ft-lb (m-kg). Area under L-D curve.

FER = Factor of energy ratio.

$$FER_{is} = \frac{E_u}{E_{is}}$$

$$FER_{ir} = \frac{E_u}{E_{ir}}$$

(c) The test procedures shall be as follows:

(i) When the protective frame structures are not an integral part of the enclosure, the direction and point of load application for both side and rear shall be the same as specified in WAC 296-306-25007(2).

(ii) When the protective frame structures are an integral part of the enclosure, apply the rear load in accordance with Fig. C-14 and record L and D simultaneously. Rear load application shall be uniformly distributed on the frame structure over an area perpendicular to the load application, no greater than 160 square inches

(1032 sq. cm.) in size with a largest dimension no greater than 27 inches (686 mm). The load shall be applied to the upper extremity of the structure at the point which is midway between the centerline of the protective enclosure and the inside of the protective structure. If no structural cross member exists at the rear of the enclosure, a substitute test beam which does not add strength to the structure may be utilized to complete this test procedure. The test shall be stopped when:

(A) The strain energy absorbed by the structure is equal to or greater than the required input Energy E<sub>ir</sub> or;

(B) Deflection of the structure exceeds the allowable deflection, (see WAC 296-306-25023 (1)(a)) or;

(C) The structure load limit (see Fig. C-5) occurs before the allowable deflection is reached in rear load.

(iii) Using data obtained in subsection (2)(c)(ii) of this section, construct the L-D diagram for rear loads as shown typically in Fig. C-5.

(iv) Calculate E<sub>ir</sub>.

(v) Calculate FER<sub>ir</sub>.

(vi) When the protective frame structures are an integral part of the enclosure, apply the side load in accordance with Fig. C-13 and record L and D simultaneously. Static side load application shall be uniformly distributed on the frame over an area perpendicular to the direction of load application, and no greater than 160 square inches (1032 sq. cm.) in size, with a largest dimension no greater than 27 inches (686 mm). Side load application shall be at a 90 degree angle to the center line of the vehicle. The center of side load application shall be located between a point "k," 24 inches (610 mm) forward; and point "l," 12 inches (305 mm) rearward of the seat reference point to best utilize the structural strength (see Fig. C-13). This side load shall be applied to the longitudinal side farthest from the point of rear load application. The test shall be stopped when:

(A) The strain energy absorbed by the structure is equal to or greater than the required input energy E<sub>is</sub>; or

(B) Deflection of the structure exceeds the allowable deflection (see WAC 296-306-25023 (1)(a)); or

(C) The structure load limit (see Figure C-5) occurs before the allowable deflection is reached in side load.

(vii) Using data obtained in subsection (2)(c)(vi) of this section construct the L-D diagram for side load as shown typically in Fig. C-5.

(viii) Calculate E<sub>is</sub>.

(ix) Calculate FER<sub>is</sub>.

(3) Dynamic test procedure.

(a) The following test conditions shall be met:

(i) The protective enclosure and tractor shall be tested at the weight defined in WAC 296-306-25007 (2)(b).

(ii) The dynamic loading shall be accomplished by use of a 4410 pound (2000 kg) weight acting as a pendulum. The impact face of the weight shall be 27 ± 1 inch by 27 ± 1 inch (686 ± 25 mm by 686 ± 25 mm) and shall be constructed so that its center of gravity is within 1 inch (25.4 mm) of its geometric center. The weight shall be suspended from a pivot point 18 to 22 feet (5.5 - 6.7 m) above the point of impact on the enclosure and shall



be conveniently and safely adjustable for height. (See Fig. C-6.)

(iii) For each phase of testing, the tractor shall be restrained from moving when the dynamic load is applied. The restraining members shall have strength no less than, and elasticity no greater than that of 0.50 inches (12.7 mm) steel cable. Points of attachment of restraining members shall be located an appropriate distance behind the rear axle and in front of the front axle to provide a 15 to 30 degree angle between the restraining cable and the horizontal. For the impact from the rear, the restraining cables shall be located in the plane in which the center of gravity of the pendulum will swing, or alternatively, two sets of symmetrically located cables may be used at lateral locations on the tractor. For the impact from the side, restraining cables shall be used as shown in Figures C-15 and C-16.

(iv) The front and rear wheel tread settings, where adjustable, shall be at the position nearest to halfway between the minimum and maximum settings obtainable on the vehicle. Where only two settings are obtainable, the minimum setting shall be used. The tires shall have no liquid ballast and shall be inflated to the maximum operating pressure recommended by the manufacturer. With specified tire inflation, the restraining cable shall be tightened to provide tire deflection of 6 to 8 percent of nominal tire section width. After the vehicle is properly restrained, a wooden beam no smaller than 6 x 6 inches (150 x 150 mm) cross-section shall be driven tightly against the appropriate wheels and clamped. For the test to the side, an additional wooden beam shall be placed as a prop against the wheel nearest the operator's station and shall be secured to the base so that it is held tightly against the wheel rim during impact. The length of this beam shall be chosen so that it is at an angle of 25 to 40 degrees to the horizontal when it is positioned against the wheel rim. It shall have a length of 20 to 25 times its depth and width 2 to 3 times its depth. (See Fig. C-15 and C-16.)

(v) Means shall be provided for indicating the maximum instantaneous deflection along the line of impact. A simple friction device is illustrated in Fig. C-4.

(vi) No repair or adjustments shall be made during the test.

(vii) If any cables, props, or blocking shift or break during the test, the test shall be repeated.

(b)  $H$  = Vertical height of center of gravity of 4410 pounds (2000 kg) weight in inches ( $H'$  in mm). The weight shall be pulled back so that the height of its center of gravity above the point of impact is:  $H = 4.92 + 0.00190 W$  or ( $H' = 125 + 0.107 W'$ ). (Fig. C-7.)

(c) The test procedures shall be as follows:

(i) The enclosure structure shall be evaluated by imposing dynamic loading from the rear followed by a load to the side on the same enclosure structure. The pendulum swinging from the height determined by subsection (3)(b) of this section shall be used to impose the dynamic load. The position of the pendulum shall be so selected that the initial point of impact on the protective structure is in line with the arc of travel of the center of

gravity of the pendulum. Where a quick release mechanism is used, it shall not influence the attitude of the block.

(ii) Impact at rear: The tractor shall be properly restrained in accordance with subsections (3)(a)(iii) and (3)(a)(iv) of this section. The tractor shall be positioned with respect to the pivot point of the pendulum so that the pendulum is 20 degrees from the vertical prior to impact as shown in Fig. C-15. The impact shall be applied to the upper extremity of the enclosure structure at the point which is midway between the center line of the enclosure structure and the inside of the protective structure. If no structural cross member exists at the rear of the enclosure structure, a substitute test beam which does not add to the strength of the structure may be utilized to complete the test procedure.

(iii) Impact at side: The blocking and restraining shall conform to subsections (3)(a)(iii) and (3)(a)(iv) of this section. The center point of impact shall be at the upper extremity of the enclosure at a 90° angle to the centerline of the vehicle and located between a point "k," 24 inches (610 mm) forward, and a point "l," 12 inches (305 mm) rearward of the seat reference point, to best utilize the structural strength. (See Fig. C-13) The side impact shall be applied to the longitudinal side farthest from the point of rear impact.

(4) Field upset test procedure.

(a) The following test conditions shall be met:

(i) The tractor shall be tested at the weight as defined in WAC 296-306-25007 (2)(b).

(ii) The test shall be conducted on a dry, firm soil bank. The soil in the impact area shall have an average cone index in the 0 to 6 inch (0 to 152 mm) layer of not less than 150. Cone index shall be determined in accordance with American Society of Agricultural Engineers Recommendation ASAE R313.1, Soil Cone Penetrometer (1971).\* The path of vehicle travel shall be  $12 \pm 2$  degrees to the top edge of bank.

(iii) An 18 inch (457 mm) high ramp as described in Fig. C-10 shall be used to assist in upsetting the vehicle to the side.

(iv) The front and rear wheel tread settings, where adjustable, shall be at the position nearest to halfway between the minimum and maximum settings obtainable on the vehicle. Where only two settings are obtainable, the minimum setting shall be used.

(b) Field upsets shall be induced to the rear and side.

(i) Rear upset shall be induced by engine power with the tractor operating in a gear to obtain 3 to 5 miles per hour (4.8 to 8.0 km per hour) at maximum governed engine rpm by driving forward directly up a minimum slope of  $60^\circ \pm 5^\circ$  as shown in Fig. C-11 or by an alternate equivalent means. The engine clutch may be used to aid in inducing the upset.

(ii) To induce side upset, the tractor shall be driven under its own power along the specified path of travel at a minimum speed of 10 miles per hour (16 km per hour), or at maximum vehicle speed if under 10 miles per hour (16 km per hour), and over the ramp as described in subsection (4)(a)(iii) of this section.

\*Copies may be obtained from American Society of Agricultural Engineers, 2950 Nils Road, St. Joseph, Michigan 49085.

[Order 76-28, § 296-306-25021, filed 9/28/76.]

Reviser's note: Exhibit B, Figures C-1 through C-16, is codified as WAC 296-306-25095.

**WAC 296-306-25023 Performance requirements.**

**(1) General requirements.**

(a) The protective enclosure structural members or other parts in the operator area may be deformed in these tests but shall not shatter or leave sharp edges exposed to the operator. They shall not encroach on a transverse plane passing through points d and f within the projected area defined by dimensions d, e and g or on the dimensions shown in Figs. C-13 and C-14 [WAC 296-306-25095] as follows:

- d = 2 in. (51 mm) inside of protective structure to vertical centerline of seat.
- e = 30 in (762 mm) at the longitudinal centerline.
- f = Not greater than 4 in. (102 mm) measured forward of the seat reference point (SRP) at the longitudinal centerline as shown in Fig. C-14 [WAC 296-306-25095].
- g = 24 in. (610 mm) minimum.
- h = 17.5 in. (445 mm) minimum.
- i = 2.0 in. (51 mm) measured from outer periphery of steering wheel.

(b) The protective structure and connecting fasteners must pass the static or dynamic tests described in subsections (2), (3) or (4) of this section at a metal temperature of 0 degrees fahrenheit or below, or exhibit Charpy V-notch impact strengths as follows:

- 10 mm x 10 mm specimen: 8 ft.-lb at -20°F.
- 10 mm x 7.5 mm specimen: 7 ft.-lb at -20°F.
- 10 mm x 5 mm specimen: 5.5 ft.-lb at -20°F.
- 10 mm x 2.5 mm specimen: 4 ft.-lb at -20°F.

Specimens shall be longitudinal and taken from flat stock, tubular, or structural sections before forming or welding for use in the protective enclosure. Specimens from tubular or structural sections shall be taken from the middle of the side of greatest dimension, not to include welds.

(c) Glazing shall conform to the requirements contained in Society of Automotive Engineers Standard SAE J674, Safety Glazing Materials (1963).\*

(d) Two or more operator exits shall be provided and positioned to avoid the possibility of both being blocked by the same accident.

(2) Static test performance requirements. In addition to meeting the requirements of subsection (1) of this section in both side and rear loads, FERis and FERir shall be greater than 1.

(3) Dynamic test performance requirements. The structural requirements will be met where the dimensions in subsection (1) of this section are adhered to in both side and rear loads.

(4) Field upset test performance requirements. The requirements of subsection (1) of this section shall be met in both side and rear upsets.

\*Copies may be obtained from the Society of Automotive Engineers, 400 Commonwealth Drive, Warrendale, Pa. 15096.

[Order 76-28, § 296-306-25023, filed 9/28/76.]

**WAC 296-306-25095 Exhibit B--Figures C-1 thru C-16.**

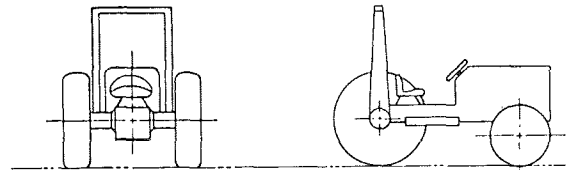


Figure C-1. Tractor with typical protective frame.

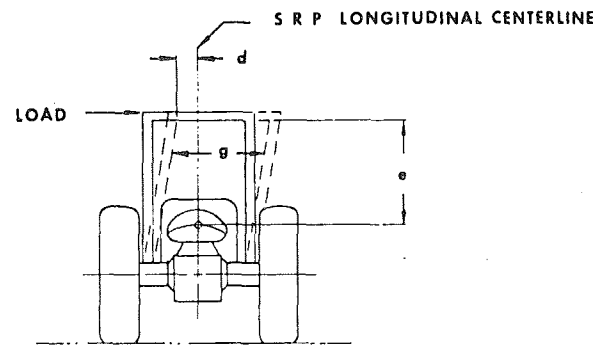


Figure C-2. Side load application.

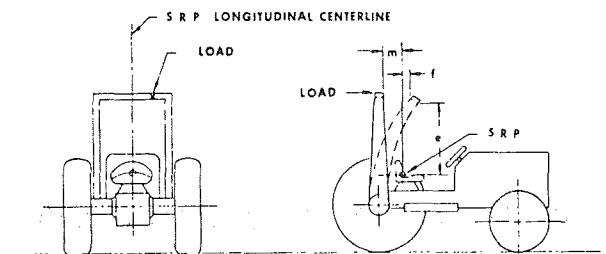


Figure C-3. Rear load application.

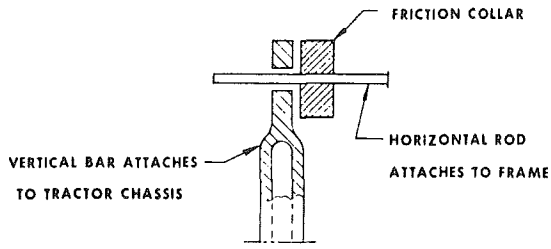


Figure C-4. Typical method of measuring deflection.

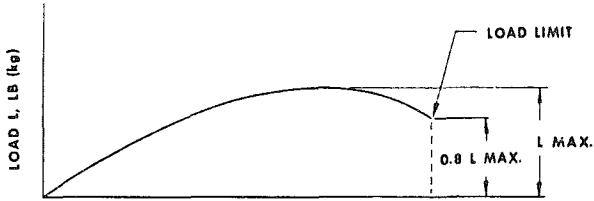


Figure C-5. Typical L-D diagram.

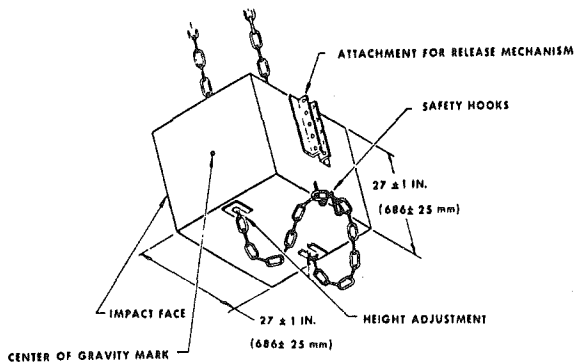


Figure C-6. Pendulum.

NOTATION OF FORMULAE

$$H = 4.92 + 0.00190 W \text{ OR } (H' = 125 + 0.107 W')$$

W = TRACTOR WEIGHT AS DEFINED IN PARAGRAPH

3.2 IN POUNDS (W' = kg)

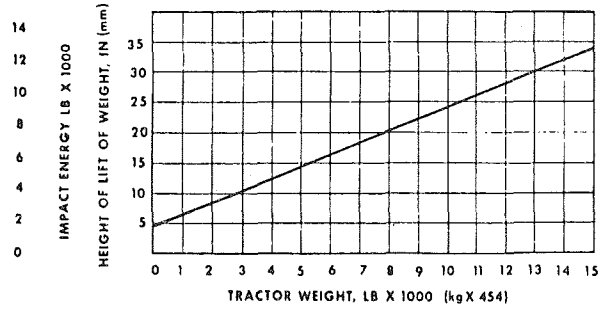


Figure C-7. Impact energy and corresponding lift height of 4410 lb (2000 kg) weight.

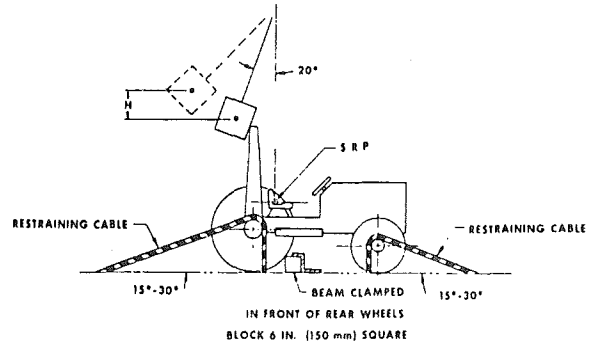


Figure C-8. Rear impact application.

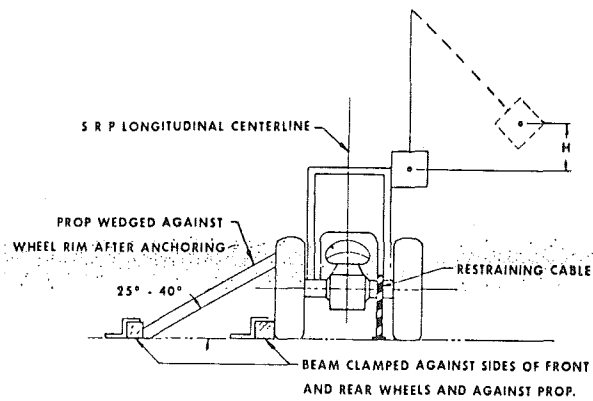


Figure C-9. Side impact application.

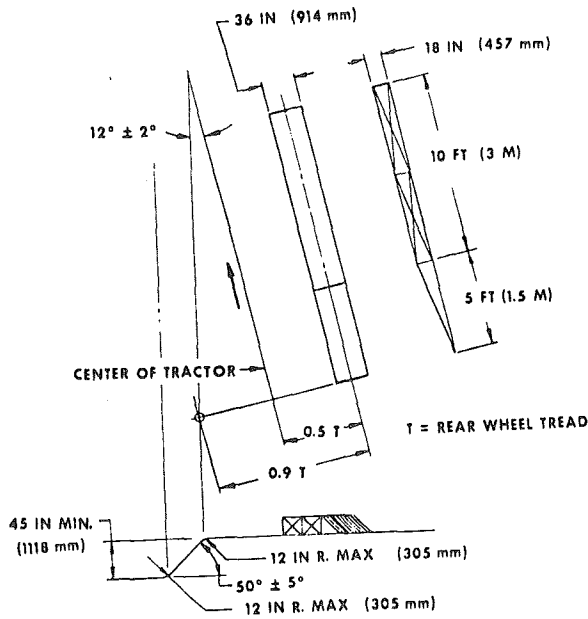


Figure C-10. Side overturn bank and ramp.

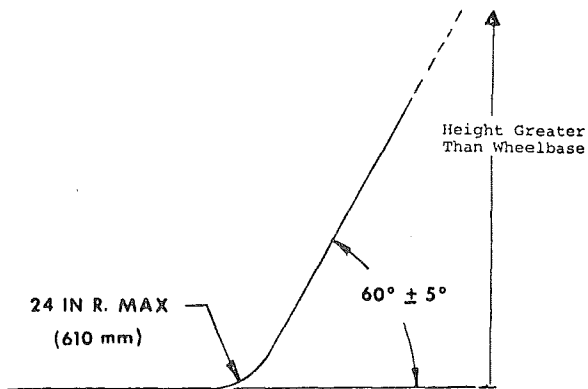


Figure C-11. Typical rear overturn bank.

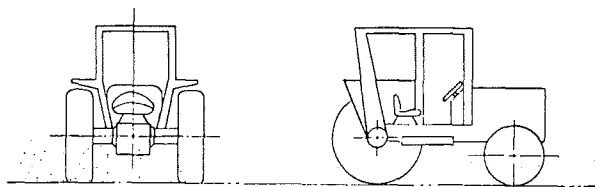


Figure C-12. Tractor with typical protective enclosure.

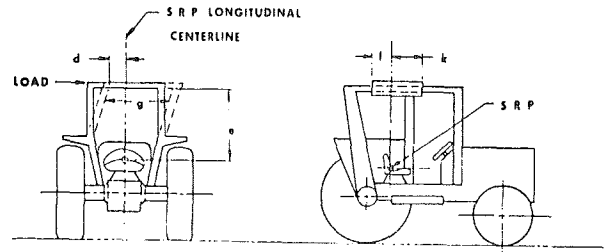


Figure C-13. Side load application.

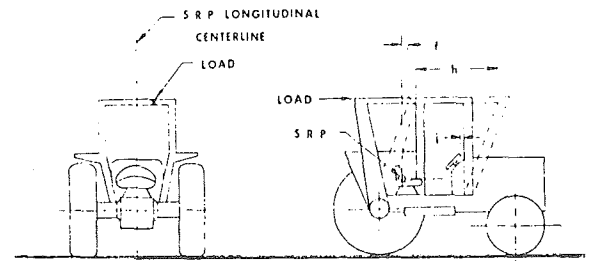


Figure C-14. Rear load application.

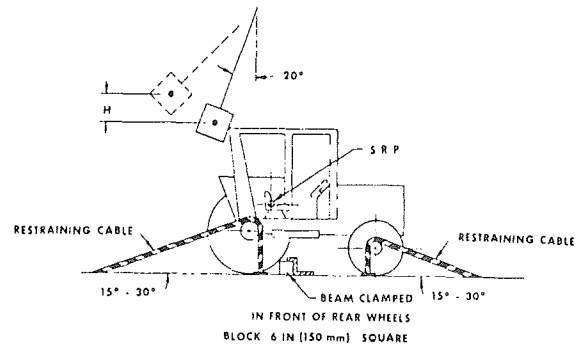


Figure C-15. Rear impact application.

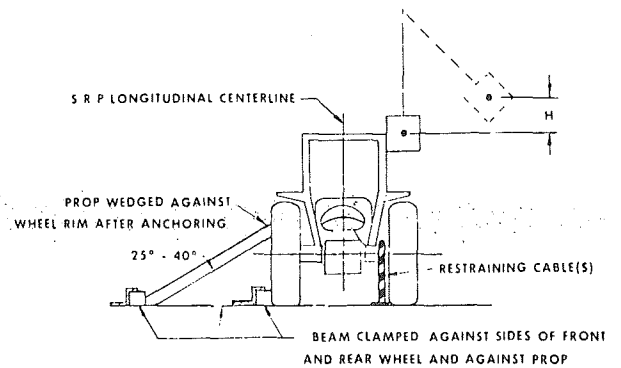


Figure C-16. Side impact application.

[Order 76-28, Exhibit B (codified as WAC 296-306-25095), filed 9/28/76.]

**WAC 296-306-260 Rollover protective structures (ROPS) for material handling equipment.** (1) Coverage. (a) This section applies to the following types of material handling equipment: To all rubber-tired, self-propelled scrapers, rubber-tired front-end loaders, rubber-tired dozers, wheel-type agricultural and industrial tractors, crawler tractors, crawler-type loaders, and motor graders, with or without attachments, that are used in agricultural work. This requirement does not apply to side-boom pipelaying tractors.

(2) Material handling machinery described in subsection (1) of this section and manufactured on or after October 25, 1976, shall be equipped with rollover protective structures which meet the minimum performance standards prescribed in WAC 296-306-260 and 296-306-265, as applicable.

(3) Rollover protective structures and supporting attachment shall meet the minimum performance criteria detailed in WAC 296-306-260 and 296-306-265, as applicable, or shall be designed, fabricated, and installed in a manner which will support, based on the ultimate strength of the metal, at least two times the weight of the prime mover applied at the point of impact.

(a) The design objective shall be to minimize the likelihood of a complete overturn and thereby minimize the possibility of the operator being crushed as a result of a rollover or upset.

(b) The design shall provide a vertical clearance of at least 52 inches from the work deck to the ROPS at the point of ingress or egress.

(4) Remounting. ROPS removed for any reason, shall be remounted with equal quality, or better, bolts or welding as required for the original mounting.

(5) Labeling. Each ROPS shall have the following information permanently affixed to the structure:

(a) Manufacturer or fabricator's name and address;

(b) ROPS model number, if any;

(c) Machine make, model, or series number that the structure is designed to fit.

[Order 76-28, § 296-306-260, filed 9/28/76.]

**WAC 296-306-26001 Minimum performance criteria for rollover protective structures for designated scrapers, loaders, dozers, graders, and crawler tractors.**

(1) Definitions. For purposes of this section, "vehicle weight" means the manufacturer's maximum weight of the prime mover for rubber-tired self-propelled scrapers. For other types of equipment to which this section applies, "vehicle weight" means the manufacturer's maximum recommended weight of the vehicle plus the heaviest attachment.

(2) General.

(a) This section prescribes minimum performance criteria for rollover protective structures (ROPS) for rubber-tired self-propelled scrapers; rubber-tired front-end loaders and rubber-tired dozers; crawler tractors, and crawler-type loaders, and motor graders. The vehicle and ROPS as a system shall have the structural characteristics prescribed in subsection (7) of this section for each type of machine described in this subsection.

[Title 296 WAC--p 2226]

(3) The static laboratory test prescribed herein will determine the adequacy of the structures used to protect the operator under the following conditions:

(a) For rubber-tired self-propelled scrapers, rubber-tired front-end loaders, and rubber-tired dozers: Operating between 0 and 10 miles per hour over hard clay where rollover would be limited to a maximum roll angle of 360° down a slope of 30° maximum.

(b) For motor graders: Operating between 0 and 10 miles per hour over hard clay where rollover would be limited to 360° down a slope of 30° maximum[.]

(c) For crawler tractors and crawler-type loaders: Operating between 0 and 10 miles per hour over hard clay where rollover would be limited to a maximum roll angle of 360° down a slope of 45°.

(4) Facilities and apparatus.

(a) The following material is necessary:

(i) Material, equipment, and tiedown means adequate to ensure that the ROPS and its vehicle frame absorb the applied energy.

(ii) Equipment necessary to measure and apply loads to the ROPS. Adequate means to measure deflection and lengths should also be provided.

(iii) Recommended, but not mandatory, types of test setups are illustrated in Figure V-1 for all types of equipment to which this section applies; and in Figure V-2 for rubber-tired self-propelled scrapers; Figure V-3 for rubber-tired front-end loaders, rubber-tired dozers, and motor graders; and Figure V-4 for crawler tractors and crawler-type loaders.

(b) Table V-1 contains a listing of the required apparatus for all types of equipment described in subsection (2)(a) of this section.

TABLE V-1

Means to measure	Accuracy
Deflection of ROPS, inches . . . . .	± 5% of deflection measured.
Vehicle weight, pounds . . . . .	± 5% of the weight measured.
Force applied to frame, pounds . . . . .	± 5% of force measured.
Dimensions of critical zone, . . . . .	±0.5 in. inches.

(5) Vehicle condition. The ROPS to be tested must be attached to the vehicle structure in the same manner as it will be attached during vehicle use. A totally assembled vehicle is not required. However, the vehicle structure and frame which support the ROPS must represent the actual vehicle installation. All normally detachable windows, panels, or nonstructural fittings shall be removed so that they do not contribute to the strength of the ROPS.

(6) Test procedure. The test procedure shall include the following, in the sequence indicated:

(a) Energy absorbing capabilities of ROPS shall be verified when loaded laterally by incrementally applying a distributed load to the longitudinal outside top member of the ROPS, as shown in Figure V-1, V-2 or V-3 as applicable. The distributed load must be applied so as to result in approximately uniform deflection of the ROPS. The load increments should correspond with approximately 0.5 in. ROPS deflection increment in the

direction of the load application, measured at the ROPS top edge. Should the operator's seat be offcenter, the load shall be applied on the offcenter side. For each applied load increment, the total load (lb.) versus corresponding deflection (in.) shall be plotted, and the area under the load-deflection curve shall be calculated. This area is equal to the energy (in.-lb.) absorbed by the ROPS. For a typical load-deflection curve and calculation method, see Figure V-5.

Incremental loading shall be continued until the ROPS has absorbed the amount of energy and the minimum applied load specified under subsection (7) of this section has been reached or surpassed.

(b) To cover the possibility of the vehicle coming to rest on its top, the support capability shall be verified by applying a distributed vertical load to the top of the ROPS so as to result in approximately uniform deflection (see Figure V-1). The load magnitude is specified in subsection (6)(b)(iii) of this section.

(c) The low temperature impact strength of the material used in the ROPS shall be verified by suitable material tests or material certification (see subsection (7)(b)(iv) of this section).

(7) Performance requirements.

(a) General performance requirements.

(i) No repairs or straightening of any member shall be carried out between each prescribed test.

(ii) During each test, no part of the ROPS shall enter the critical zone as detailed in SAE J397 (1969). Deformation of the ROPS shall not allow the plane of the ground to enter this zone.

(b) Specific performance requirements.

(i) The energy requirement for purposes of meeting the requirements of subsection (6)(a) of this section is to be determined by referring to the plot of the energy versus weight of vehicle (see Figure V-6 for rubber-tired self-propelled scrapers; Figure V-7 for rubber-tired front-end loaders and rubber-tired dozers; Figure V-8 for crawler tractors and crawler-type loaders; and Figure V-9 for motor graders. For purposes of this section force and weight are measured as pounds (lb.); energy (U) is measured as inch-pounds).

(ii) The applied load must attain at least a value which is determined by multiplying the vehicle weight by the corresponding factor shown in Figure V-10 for rubber-tired self-propelled scrapers; in Figure V-11 for rubber-tired front-end loaders and rubber-tired dozers; in Figure V-12 for crawler tractors and crawler-type loaders; and in Figure V-13 for motor graders.

(iii) The load magnitude for purposes of compliance with subsection (6)(b) of this section is equal to the vehicle weight. The test of load magnitude shall only be made after the requirements of subdivision (b)(i) of this subsection are met.

(iv) Material used in the ROPS must have the capability of performing at zero degrees Fahrenheit, or exhibit Charpy V notch impact strength of 8 foot-pounds at minus 20° Fahrenheit. This is a standard Charpy specimen as described in American Society of Testing and Materials A 370, Methods and Definitions for Mechanical Testing of Steel Products. The purpose of this

requirement is to reduce the tendency of brittle fracture associated with dynamic loading, low temperature operation, and stress raisers which cannot be entirely avoided on welded structures.

(8) Source of standard. This standard is derived from, and restates, the following Society of Automotive Engineers Recommended Practices: SAE J320a, Minimum Performance Criteria for Roll-Over Protective Structure for Rubber-Tired, Self-Propelled Scrapers; SAE J394, Minimum Performance Criteria for Roll-Over Protective Structure for Rubber-Tired Front-End Loaders and Rubber-Tired Dozers; SAE J395, Minimum Performance Criteria for Roll-Over Protective Structure for Crawler Tractors and Crawler-Type Loaders; and SAE J396, Minimum Performance Criteria for Roll-Over Protective Structure for Motor Graders. These recommended practices shall be resorted to in the event that questions of interpretation arise. The recommended practices appear in the 1971 SAE Handbook, which may be examined in each of the district offices of the division of industrial safety and health of the department of labor and industries.

[Order 76-28, § 296-306-26001, filed 9/28/76.]

Reviser's note: Exhibit B, Figures V-1 through V-28, is codified as WAC 296-306-27095.

**WAC 296-306-265 Protective frame (ROPS) test procedures and performance requirements for wheel-type agricultural and industrial tractors used in agriculture.**

(1) Definitions applicable to this section. (a) SAE J333a, Operator Protection for Wheel-Type Agricultural and Industrial Tractors (July 1970) defines "agricultural tractor" as a "wheel-type vehicle of more than 20 engine horsepower designed to furnish the power to pull, carry, propel, or drive implements that are designed for agricultural usage." Since this chapter applies only to agricultural work, the following definition of "agricultural tractor" is adopted for purposes of this part: "Agricultural tractor" means a wheel-type vehicle of more than 20 engine horsepower, which is designed to furnish the power to pull, propel, or drive implements.

(b) "Industrial tractor" means that class of wheeled type tractor of more than 20 engine horsepower (other than rubber-tired loaders and dozers described in WAC 296-306-260), used in operations such as landscaping, construction services, loading, digging, grounds keeping, and highway maintenance.

(c) The following symbols, terms, and explanations apply to this section:

Eis = Energy input to be absorbed during side loading.  $E_{is} = 723 + 0.4 W \text{ ft.-lb.}$  ( $E'_{is} = 100 + 0.12 W', \text{m.-kg.}$ )

Eir = Energy input to be absorbed during rear loading.  $E_{ir} = 0.47 W \text{ ft. - lb.}$  ( $E'_{ir} = 0.14 W', \text{m. - kg.}$ )

W = Tractor weight as prescribed in WAC 296-306-265 (5)(a) and (5)(c) in lb. ( $W'$ , kg).

L = Static load, lb. (kg.).

D = Deflection under L, in. (mm.).

L-D = Static load-deflection diagram.

Lm-Dm = Modified static load-deflection diagram (Figure V-20). To account for increase in strength due to increase in strain rate, raise L in plastic range to  $L \times K$ .

K = Increase in yield strength induced by higher rate of loading (1.3 for hot rolled low carbon steel 1010-1030). Low carbon is preferable; however, if higher carbon or other material is used, K must be determined in the laboratory. Refer to Charles H. Norris, et al., *Structural Design for Dynamic Loads* (1959), p. 3.

Lmax = Maximum observed static load.  
Load

Limit = Point on L-D curve where observed static load is 0.8 Lmax (refer to Figure V-19).

Eu = Strain energy absorbed by the frame, ft.-lb. (m. - kg) area under Lm-Dm curve.

FER = Factor of energy ratio,  $FER = Eu/Eis$ ; also  $= Eu/Eir$ .

Pb = Maximum observed force in mounting connection under static load, L, lb. (kg.).

FSB = Design margin for mounting connection  $FSB = (Pu/Pb)-1$ .

H = Vertical height of lift of 4,410 lb. (2,000 kg.) weight, in. (H', mm.). The weight shall be pulled back so that the height of its center of gravity above the point of impact is defined as follows:  $H = 4.92 + 0.00190 W$  or  $(H' = 125 + 0.107 W')$  (Figure V-14).

(ii) Source of standard. The standard in this section is derived from, and restates, Society of Automotive Engineers Standard J334a (July 1970), Protective Frame Test Procedures and Performance Requirements. This standard shall be resorted to in the event that questions of interpretation arise. The standard appears in the 1971 SAE handbook.

## (2) General.

(a) The purpose of this section is to set forth requirements for frames for the protection of operators of wheel type agricultural and industrial tractors to minimize the possibility of operator injury resulting from accidental upsets during normal operation. With respect to agricultural and industrial tractors, the provisions of WAC 296-306-260 and 296-306-270 for rubber-tired dozers and rubber-tired loaders may be utilized in lieu of the requirements of this section.

(b) The protective frame which is the subject of this standard is a structure mounted to the tractor that extends above the operator's seat and conforms generally to Figure V-15.

(c) If an overhead weather shield is attached to the protective frame, it may be in place during tests: *Provided*, That it does not contribute to the strength of the protective frame. If such an overhead weather shield is attached, it must meet the requirements of subsection (10) of this section.

(d) For overhead protection requirements, see WAC 296-306-270.

(e) If protective enclosures are used on wheel-type agricultural and industrial tractors, they shall meet the

requirements of Society of Automotive Engineers Standard J168 (July 1970), Protective Enclosures, Test Procedures, and Performance Requirements.

(3) Applicability. The requirements of this section apply to wheel-type agricultural tractors used in agriculture work and to wheel-type industrial tractors used in construction type work. See subsection (1) of this section for definitions of agricultural tractors and industrial tractors.

(4) Performance requirements.

(a) Either a laboratory test or a field test is required in order to determine the performance requirements set forth in subsection (10) of this section.

(b) A laboratory test may be either static or dynamic. The laboratory test must be under conditions of repeatable and controlled loading in order to permit analysis of the protective frame.

(c) A field upset test, if used, shall be conducted under reasonably controlled conditions, both rearward and sideways, to verify the effectiveness of the protective frame under actual dynamic conditions.

(5) Test procedure—General.

(a) The tractor used shall be the tractor with the greatest weight on which the protective frame is to be used.

(b) A new protective frame and mounting connections of the same design shall be used for each test procedure.

(c) Instantaneous and permanent frame deformation shall be measured and recorded for each segment of the test.

(d) Dimensions relative to the seat shall be determined with the seat unloaded and adjusted to its highest and most rearward latched position provided for a seated operator.

(e) If the seat is offset, the frame loading shall be on the side with the least space between the centerline of the seat and the upright.

(f) The low temperature impact strength of the material used in the protective structure shall be verified by suitable material tests or material certifications in accordance with WAC 296-306-26001 (7)(b)(iv).

(6) Test procedure for vehicle overturn.

(a) Vehicle weight. The weight of the tractor, for purposes of this section, includes the protective frame, all fuels, and other components required for normal use of the tractor. Ballast must be added if necessary to achieve a minimum total weight of 130 lb. (59 kg.) per maximum power takeoff horsepower at rated engine speed. The weight of the front end must be at least 33 lb. (15 kg.) per maximum power takeoff horsepower. In case power takeoff horsepower is unavailable, 95 percent of net engine flywheel horsepower shall be used.

(b) Agricultural tractors shall be tested at the weight set forth in subdivision (a) of this subsection.

(c) Industrial tractors shall be tested with items of integral or mounted equipment and ballast that are sold as standard equipment or approved by the vehicle manufacturer for use with the vehicle where the protective frame is expected to provide protection for the operator with such equipment installed. The total vehicle weight



and front end weight as tested shall not be less than the weights established in subdivision (a) of this subsection.

(d) The test shall be conducted on a dry, firm soil bank as illustrated in Figure V-16. The soil in the impact area shall have an average cone index in the 0.6 in. (153 mm.) layer not less than 150 according to American Society of Agricultural Engineers Recommendations ASAE R313, Soil Cone Penetrometer. The path of travel of the vehicle shall be  $12^{\circ} \pm 2^{\circ}$  to the top edge of the bank.

(e) The upper edge of the bank shall be equipped with an 18 in. (457 mm.) high ramp as described in Figure V-16 to assist in tipping the vehicle.

(f) The front and rear wheel tread settings, where adjustable, shall be at the position nearest to halfway between the minimum and maximum settings obtainable on the vehicle. Where only two settings are obtainable, the minimum setting shall be used.

(g) Vehicle overturn test—Sideways and rearward. (i) The tractor shall be driven under its own power along the specified path of travel at a minimum speed of 10 m.p.h. (16 km./hr.) or maximum vehicle speed if under 10 m.p.h. (16 km./hr.) up the ramp as described in subdivision (e) of this subsection to induce sideways overturn.

(ii) Rear upset shall be induced by engine power with the tractor operating in gear to obtain 3-5 m.p.h. (4.8-8 km./hr.) at maximum governed engine r.p.m. preferably by driving forward directly up a minimum slope of two vertical to one horizontal. The engine clutch may be used to aid in inducing the upset.

(7) Other test procedures. When the field upset test is not used to determine ROPS performance, either the static test or the dynamic test, contained in subsection (8) or (9) of this section, shall be made.

(8) Static test.

(a) Test conditions.

(i) The laboratory mounting base shall include that part of the tractor chassis to which the protective frame is attached including the mounting parts.

(ii) The protective frame shall be instrumented with the necessary equipment to obtain the required load deflection data at the locations and directions specified in Figure V-17, V-18, and V-19.

(iii) The protective frame and mounting connections shall be instrumented with the necessary recording equipment to obtain the required load-deflection data to be used in calculating FSB (see subsection (1)(c) of this section). The gauges shall be placed on mounting connections before the installation load is applied.

(b) Test procedure.

(i) The side load application shall be at the upper extremity of the frame upright at a  $90^{\circ}$  angle to the centerline of the vehicle. The side load "L" shall be applied according to Figure V-17. "L" and "D" shall be recorded simultaneously. The test shall be stopped when:

(A) The strain energy absorbed by the frame is equal to the required input energy (Eis) or

(B) Deflection of the frame exceeds the allowable deflection, or

(C) The frame load limit occurs before the allowable deflection is reached in the side load.

(ii) The L-D diagram, as shown by means of a typical example in Figure V-20, shall be constructed, using the data obtained in accordance with item (i) of this subdivision.

(iii) The modified Lm-Dm diagram shall be constructed according to item (ii) of this subdivision and according to Figure V-21. The strain energy absorbed by the frame (Eu) shall then be determined.

(iv) Eis, FER, and FSB shall be calculated.

(v) The test procedure shall be repeated on the same frame utilizing L (rear input; see Figure V-19) and Eir. Rear load application shall be uniformly distributed along a maximum projected dimension of 27 in. (686 mm.) and a maximum area of 160 sq. in. (1,032 sq. cm.) normal to the direction of load application. The load shall be applied to the upper extremity of the frame at the point which is midway between the centerline of the seat and the inside of the frame upright.

(9) Dynamic test.

(a) Test conditions.

(i) The protective frame and tractor shall meet the requirements of subsection (6)(b) or (c) of this section, as appropriate.

(ii) The dynamic loading shall be produced by use of a 4,410 lb. (2,000 kg.) weight acting as a pendulum. The impact face of the weight shall be 27 plus or minus 1 in. by 27 plus or minus 1 in. (686 + or - 25 mm.) and shall be constructed so that its center of gravity is within 1 in. (25.4 mm.) of its geometric center. The weight shall be suspended from a pivot point 18-22 ft. (5.5-6.7 m.) above the point of impact on the frame and shall be conveniently and safely adjustable for height. (See Figure V-22.)

(iii) For each phase of testing, the tractor shall be restrained from moving when the dynamic load is applied. The restraining members shall be of 0.5-0.63 in. (12.5-16 mm.) steel cable and points of attaching restraining members shall be located an appropriate distance behind the rear axle and in front of the front axle to provide a  $15^{\circ}$ - $30^{\circ}$  angle between a restraining cable and the horizontal. The restraining member shall either be in the plane in which the center gravity of the pendulum will swing or more than one restraining cable shall give a resultant force in this plane. (See Figure V-23.)

(iv) The wheel tread setting shall comply with the requirements of subsection (6)(f) of this section. The tires shall have no liquid ballast and shall be inflated to the maximum operating pressure recommended by the tire manufacturer. With specified tire inflation, the restraining cables shall be tightened to provide tire deflection of 6-8 percent of nominal tire section width. After the vehicle is properly restrained, a wooden beam 6 x 6 in. (15 x 15 cm.) shall be driven tightly against the appropriate wheels and clamped. For the test to the side, an additional wooden beam shall be placed as a prop against the wheel nearest the operator's station and shall be secured to the floor so that it is held tightly against the wheel rim during impact. The length of this beam shall be chosen so that when it is positioned against the wheel

rim it is at an angle of 25°-40° to the horizontal. It shall have a length 20-25 times its depth and a width two to three times its depth. (See Figures V-23 and V-24.)

(v) Means shall be provided indicating the maximum instantaneous deflection along the line of impact. A simple friction device is illustrated in Figure V-24.

(vi) No repair or adjustments may be carried out during the test.

(vii) If any cables, props, or blocking shift or break during the test, the test shall be repeated.

(b) Test procedure.

(i) General. The frame shall be evaluated by imposing dynamic loading to rear followed by a load to the side on the same frame. The pendulum dropped from the height (see definition "H" in subsection (1)(c) of this section) imposes the dynamic load. The position of the pendulum shall be so selected that the initial point of impact on the frame shall be in line with the arc of travel of the center of gravity of the pendulum. A quick release mechanism should be used but, if used, shall not influence the attitude of the block.

(ii) Impact at rear. The tractor shall be properly restrained according to subdivisions (a)(iii) and (iv) of this section. The tractor shall be positioned with respect to the pivot point of the pendulum such that the pendulum is 20° from the vertical prior to impact, as shown in Figure V-23. The impact shall be applied to the upper extremity of the frame at the point which is midway between the centerline of the seat and the inside of the frame upright of a new frame.

(iii) Impact at side. The block and restraining shall conform to subdivisions (a)(iii) and (iv) of this subsection. The point of impact shall be that structural member of the protective frame likely to hit the ground first in a sideways accidental upset. The side impact shall be applied to the side opposite that used for rear impact.

(10) Performance requirements.

(a) General.

(i) The frame, overhead weather shield, fenders, or other parts in the operator area may be deformed but shall not shatter or leave sharp edges exposed to the operator, or violate dimensions as shown in Figures V-17 and V-18 as follows:

D = 2 in. (51 mm.) inside of frame upright to vertical centerline of seat.

E = 30 in. (762 mm.).

F = Not less than 0 in. and not more than 12 in. (305 mm.), measured at centerline front of seat backrest to crossbar along the line of load application as shown in Figure V-17.

G = 24 in. (610 mm.).

(ii) The material and design combination used in the protective structure must be such that the structure can meet all prescribed performance tests at zero degrees Fahrenheit in accordance with WAC 296-306-26001 (7)(b)(iv).

(b) Vehicle overturn performance requirements. The requirements of this subsection (10) must be met in both side and rear overturns.

(c) Static test performance requirements. Design factors shall be incorporated in each design to withstand an overturn test as prescribed in this subsection (10). The structural requirements will be generally met if FER is greater than 1 and FSB is greater than K-1 in both side and rear loadings.

(d) Dynamic test performance requirements. Design factors shall be incorporated in each design to withstand the overturn test prescribed in this subsection (10). The structural requirements will be generally met if the dimensions in this subsection (10) are adhered to in both side and rear loads.

[Order 76-28, § 296-306-265, filed 9/28/76.]

Reviser's note: Exhibit B, Figures V-1 through V-28, is codified as WAC 296-306-27095.

**WAC 296-306-270 Overhead protection for operators of agricultural and industrial tractors. (1) General.**

(a) Purpose. When overhead protection is provided on wheel-type agricultural and industrial tractors, the overhead protection shall be designed and installed according to the requirements contained in this section. The provisions of WAC 296-306-26001 for rubber-tired dozers and rubber-tired loaders may be used in lieu of the standards contained in this section. The purpose of the standard is to minimize the possibility of operator injury resulting from overhead hazards such as flying and falling objects, and at the same time to minimize the possibility of operator injury from the cover itself in the event of accidental upset.

(b) Applicability. This section applies to wheel-type agricultural tractors used in construction work and to wheel-type industrial tractors used in agriculture work. See WAC 296-306-265 (1) and (3).

(c) All equipment used in site clearing operations shall be equipped with rollover guards meeting the requirements of this chapter. In addition, rider-operated equipment shall be equipped with an overhead and rear canopy guard meeting the following requirements:

(i) The overhead covering on this canopy structure shall be of not less than 1/8-inch steel plate or 1/4-inch woven wire mesh with openings no greater than 1 inch, or equivalent.

(ii) The opening in the rear of the canopy structure shall be covered with not less than 1/4-inch woven wire mesh with openings no greater than 1 inch.

(2) Overhead protection. When overhead protection is installed on wheel-type agricultural or industrial tractors used in agriculture work, it shall meet the requirements of this subsection. The overhead protection may be constructed of a solid material. If grid or mesh is used, the largest permissible opening shall be such that the maximum circle which can be inscribed between the elements of the grid or mesh is 1.5 in. (38 mm.) in diameter. The overhead protection shall not be installed in such a way as to become a hazard in the case of upset.

(3) Test procedures—General.

(a) The requirements of WAC 296-306-265 (5), (6) and (7) shall be met.

(b) Static and dynamic rear load application shall be uniformly distributed along a maximum projected dimension of 27 in. (686 mm.) and a maximum area of 160 in.<sup>2</sup> (1,032 cm.<sup>2</sup>) normal direction of load application. The load shall be applied to the upper extremity of the frame at the point which is midway between the centerline of the seat and the inside of the frame upright.

(c) The static and dynamic side load application shall be uniformly distributed along a maximum projected dimension of 27 in. (686 mm.) and a maximum area of 160 in.<sup>2</sup> (1,032 cm.<sup>2</sup>) normal to the direction of load application. The direction of load application is the same as in WAC 296-306-265 (8) and (9). To simulate the characteristics of the structure during an upset, the center of load application may be located from a point 24 in. (610 mm.) (K) forward to 12 in. (305 mm.) (K) forward to 12 in. (305 mm.) (L) rearward of the front of the seat backrest to best utilize the structural strength. See Figure V-25.

(4) Drop test procedures.

(a) The same frame shall be subjected to the drop test following either the static or dynamic test.

(b) A solid steel sphere or material of equivalent spherical dimension weighing 100 lb. (45.4 kg.) shall be dropped once from a height 10 ft. (3,048 mm.) above the overhead cover.

(c) The point of impact shall be on the overhead cover at a point within the zone of protection as shown in Figure V-26, which is furthest removed from major structural members.

(5) Crush test procedures.

(a) The same frame shall be subjected to the crush test following the drop test and static or dynamic test.

(b) The test load shall be applied as shown in Figure V-27 with the seat positioned as specified in WAC 296-306-265 (5)(d). Loading cylinders shall be pivotally mounted at both ends. Loads applied by each cylinder shall be equal within 2 percent, and the sum of the loads of the two cylinders shall be two times the tractor weight as set forth in WAC 296-306-265 (6)(a). The maximum width of the beam illustrated in Figure V-27 shall be 6 in. (152 mm.).

(6) Performance requirements.

(a) General. The performance requirements set forth in WAC 296-306-265 (10)(b), (c) and (d) shall be met.

(b) Drop test performance requirements.

(i) Instantaneous deformation due to impact of the sphere shall not enter the protected zone as illustrated in Figures V-25, V-26, and V-28.

(ii) In addition to the dimensions set forth in WAC 296-306-265 (10)(a)(i) the following dimensions apply to Figure V-28:

H = 17.5 in. (444 mm.).

J = 2 in. (50.8 mm.) measured from the outer periphery of the steering wheel.

(c) Crush test performance requirements. The protected zone as described in Figure V-28 must not be violated.

(7) Source of standard. This standard is derived from, and restates, the portions of Society of Automotive Engineers Standard J167 which pertain to overhead protection requirements. The full title of the SAE standard is: Protective Frame with Overhead Protection—Test Procedures and Performance Requirements. The SAE standard shall be resorted to in the event that questions of interpretation arise. The SAE standard appears in the 1971 SAE Handbook.

[Order 76-28, § 296-306-270, filed 9/28/76.]

Reviser's note: Exhibit B, Figures V-1 through V-28, is codified as WAC 296-306-27095.

**WAC 296-306-27095 Exhibit B—Figures V-1 through V-28.**

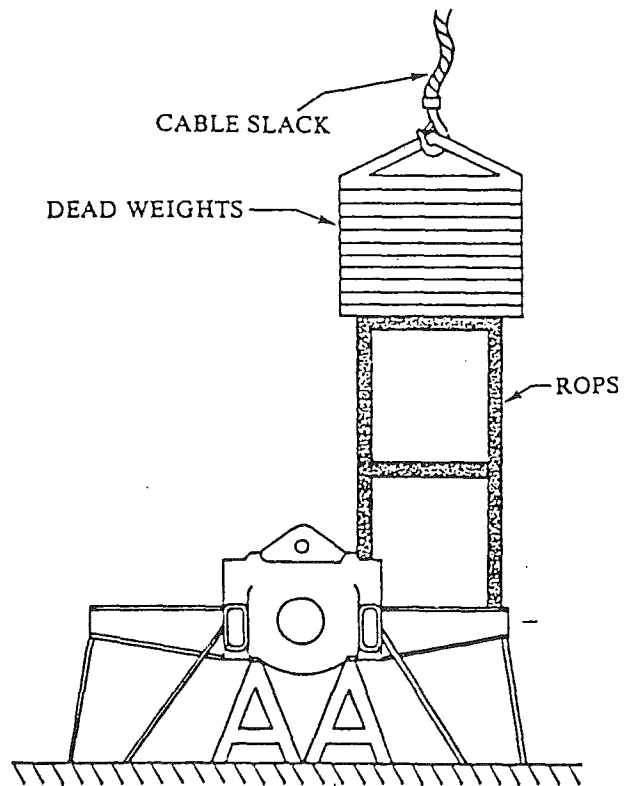


Figure V-1  
Vertical loading setup for all types of equipment described in WAC 296-306-270.

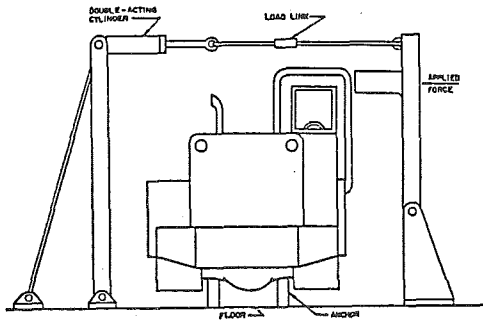
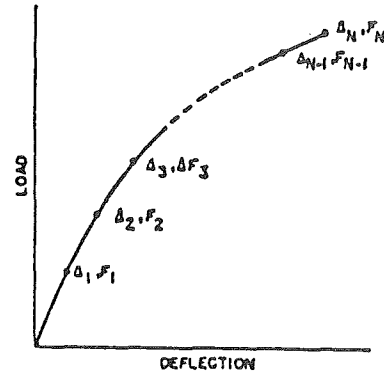


Figure V-2  
Test setup for rubber-tired self-propelled scrapers.



Δ - TOTAL DEFLECTION  
F - FORCE APPLIED

$$\text{AREA} = \frac{\Delta_1 F_1}{2} + (\Delta_2 - \Delta_1) \frac{F_1 + F_2}{2} + (\Delta_3 - \Delta_2) \frac{F_2 + F_3}{2} + \dots + (\Delta_N - \Delta_{N-1}) \frac{F_{N-1} + F_N}{2}$$

Figure V-5  
Determination of energy area under force deflection curve.

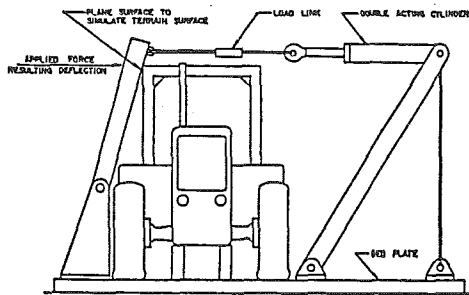


Figure V-3  
Test setup for rubber-tired front-end loaders, rubber-tired dozers, and motor graders.

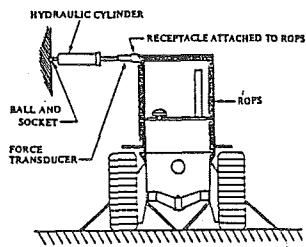


Figure V-4  
Side-loading setup for crawler tractors and crawler loaders.

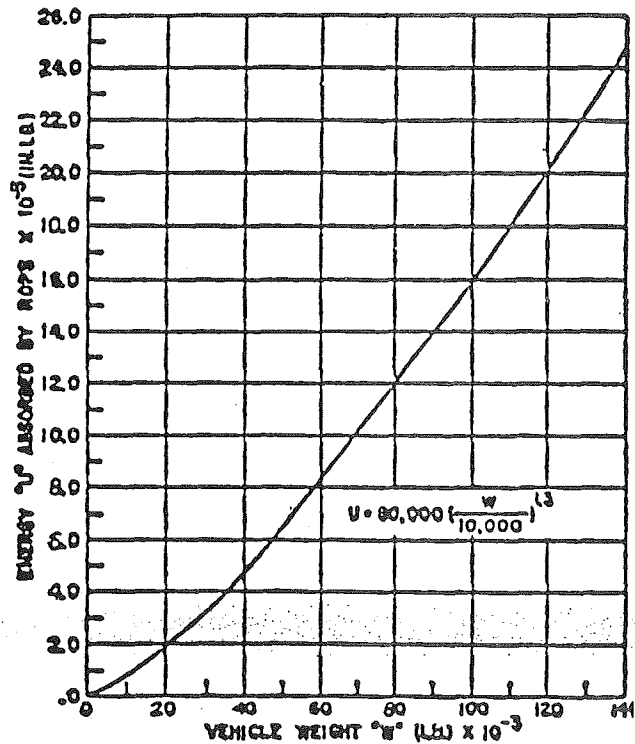


Figure V-6  
Energy absorbed versus vehicle weight.

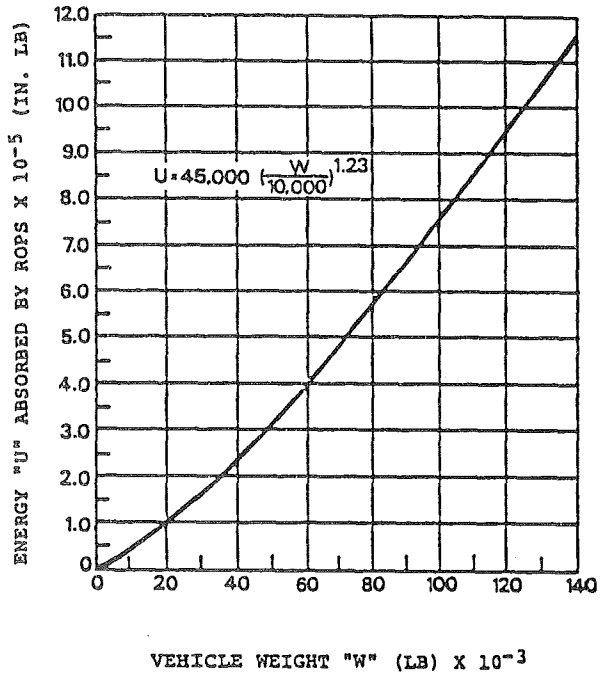


Figure V-7  
Energy absorbed versus vehicle weight.

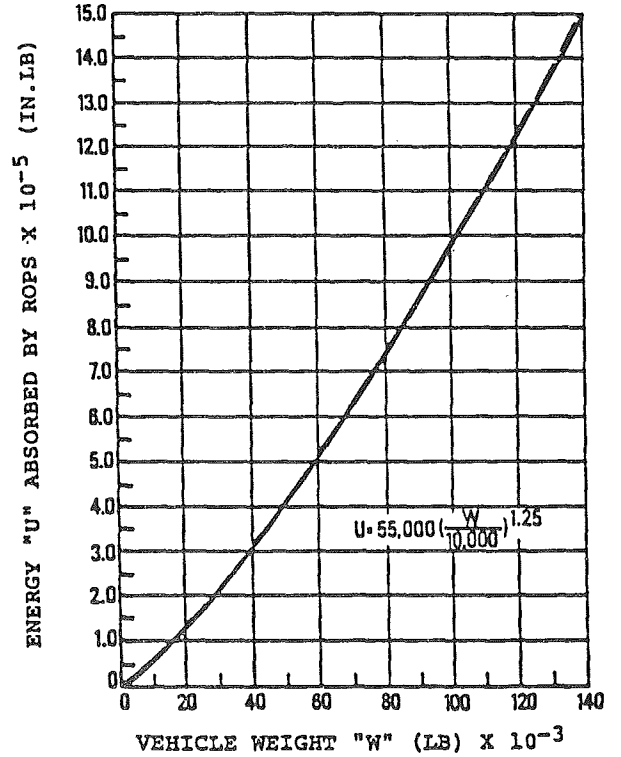


Figure V-9  
Energy absorbed versus vehicle weight.

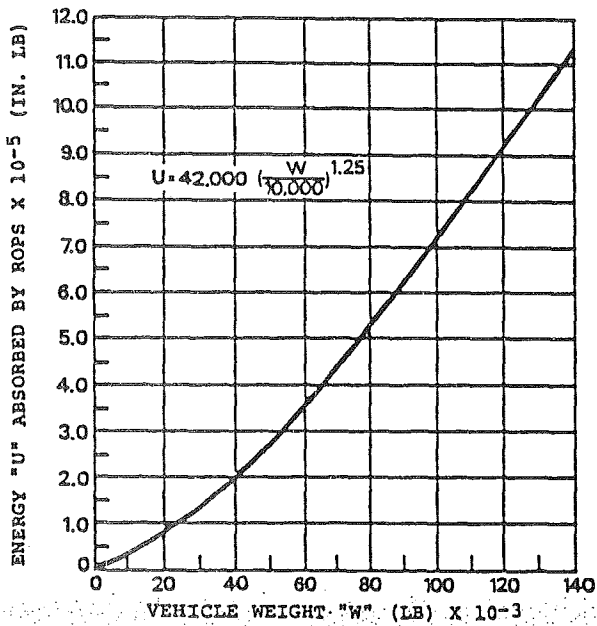


Figure V-8  
Energy absorbed versus vehicle weight.

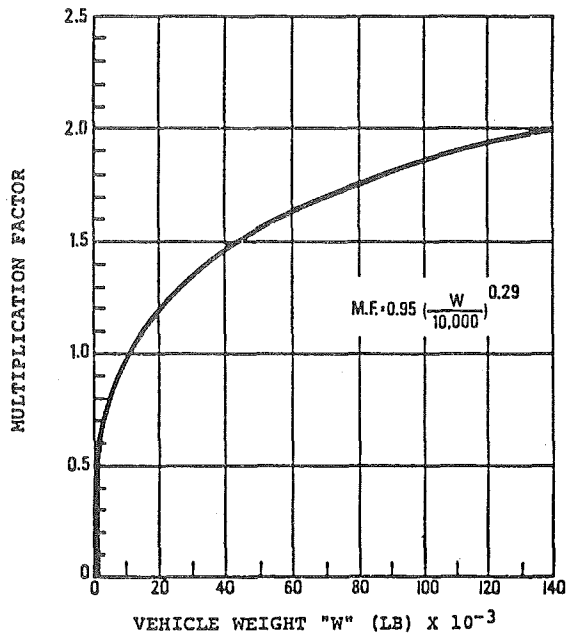


Figure V-10  
Minimum horizontal load factor for self-propelled scrapers.

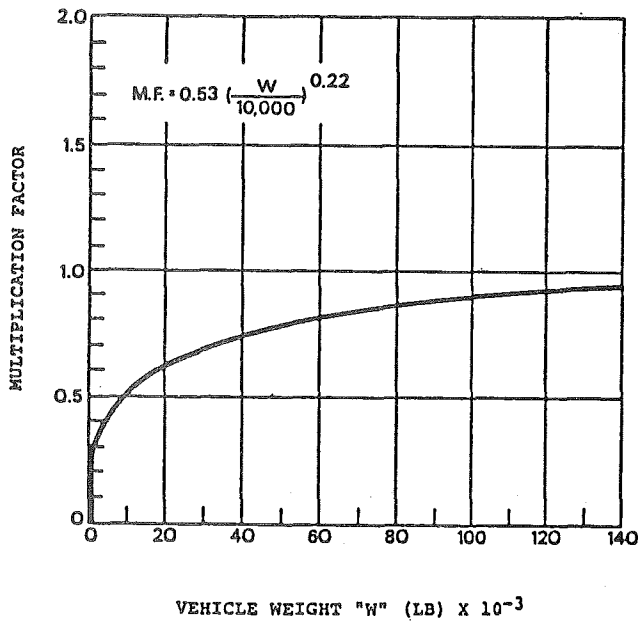


Figure V-11  
Minimum horizontal load factor for rubber-tired loaders and dozers.

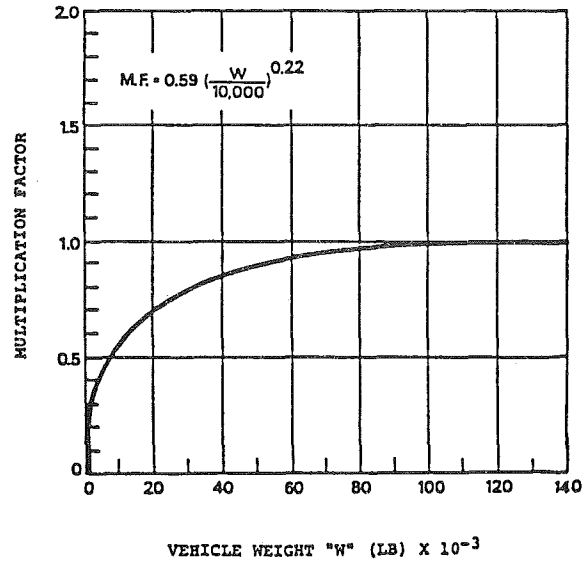


Figure V-12  
Minimum horizontal load factor for crawler tractors and crawler-type loaders.

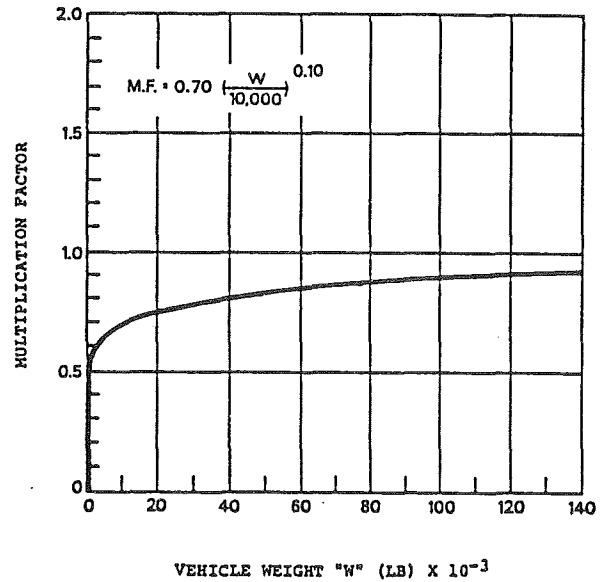


Figure V-13  
Minimum horizontal load factor for motor graders.

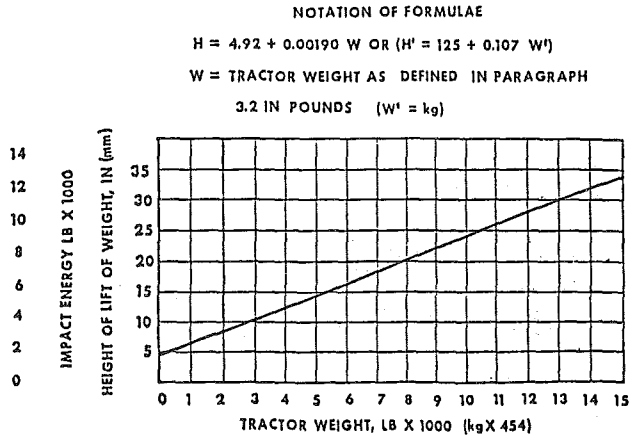


Figure V-14  
Impact energy and corresponding lift height of 4,410 lb.  
(2,000 kg.) weight.

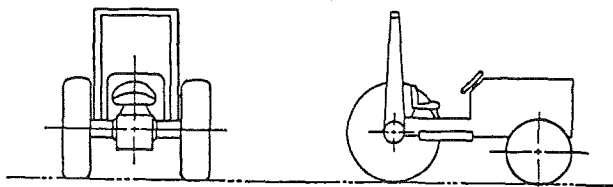


Figure V-15  
Typical frame configuration.

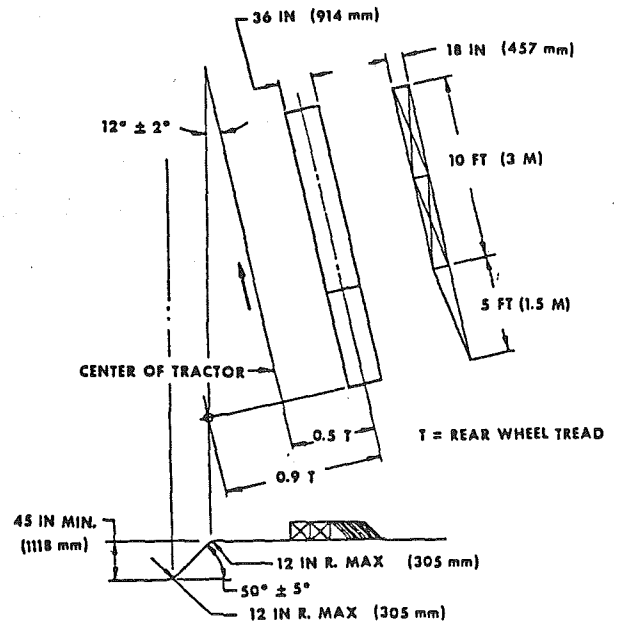


Figure V-16  
Bank and ramp configuration for side overturn testing.

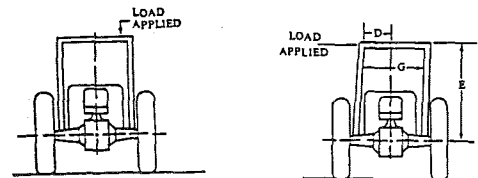


Figure V-17  
Side load application.

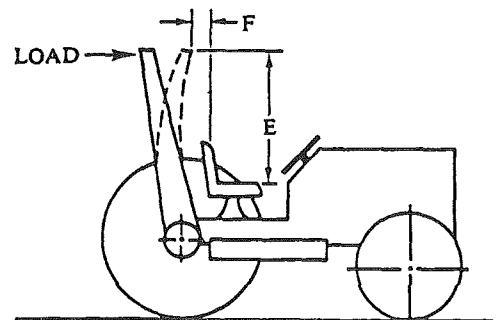


Figure V-18  
Rear load application.



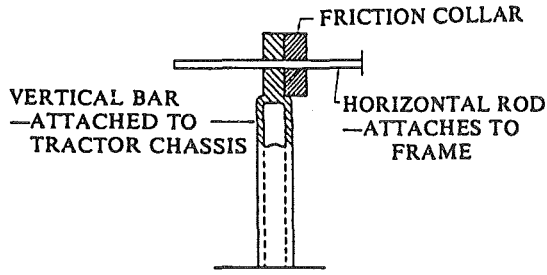


Figure V-19  
 Method of measuring instantaneous deflection.

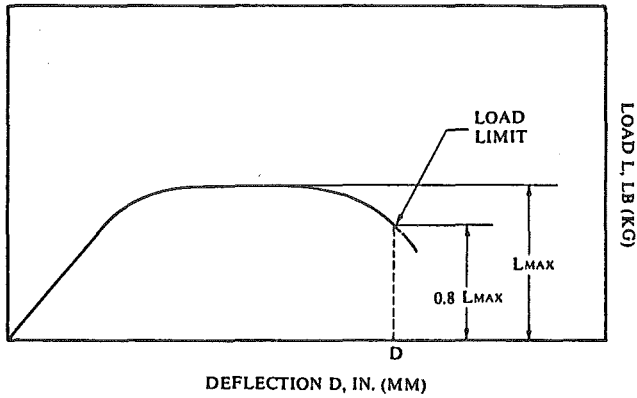


Figure V-20  
 Typical L-D diagram.

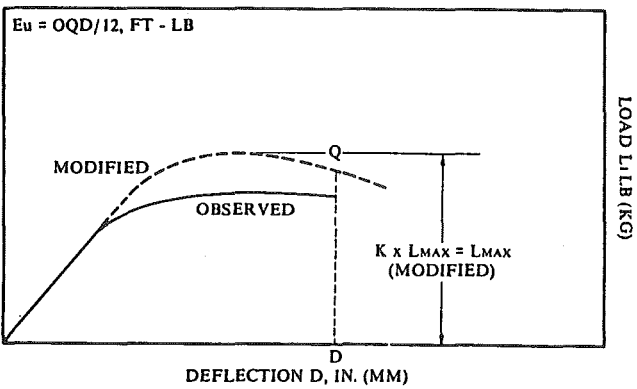


Figure V-21  
 Typical modified  $L_m-D_m$  diagram.

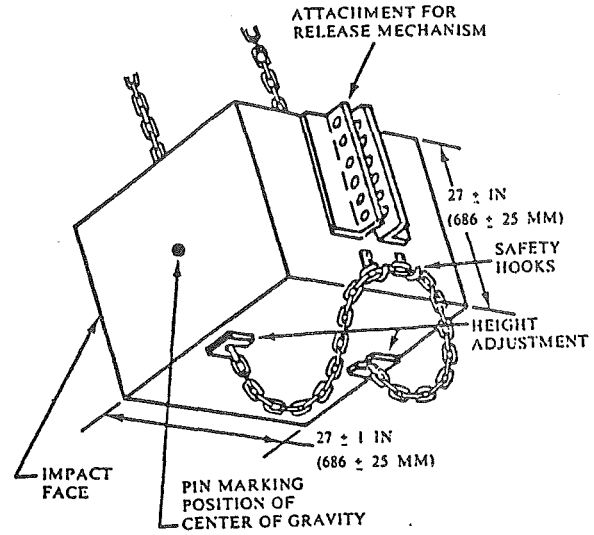


Figure V-22  
 Pendulum.

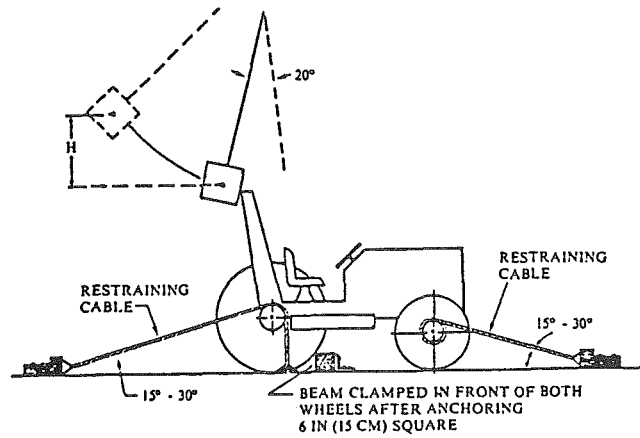


Figure V-23  
 Method of impact from rear.

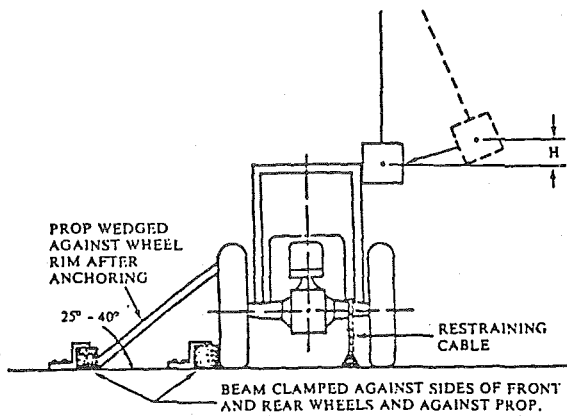


Figure V-24  
Method of impact from side.

ALL POSSIBLE LATERAL  
WORKING POSITIONS OF  
SEAT

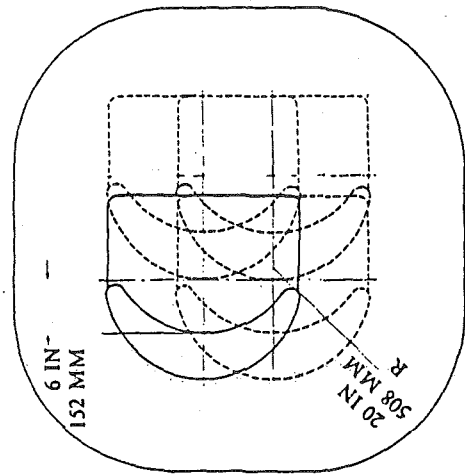


Figure V-26  
Zone of protection for drop test.

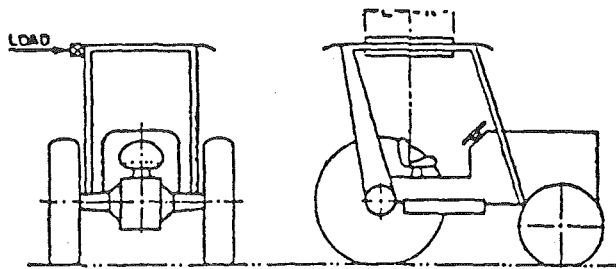


Figure V-25  
Location for side load.

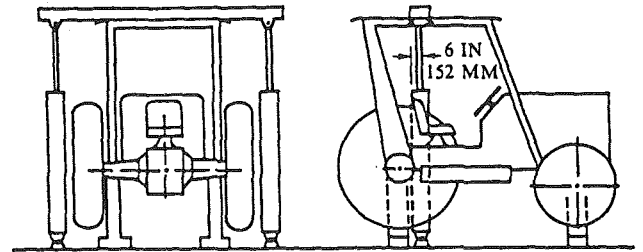


Figure V-27  
Method of load application for crush test.

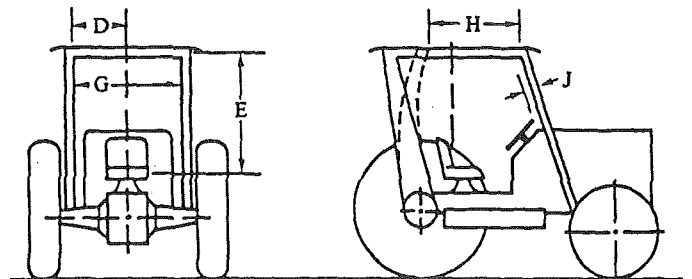


Figure V-28  
Protected zone during crush and drop tests.

[Statutory Authority: Chapter 49.17 RCW, 87-24-051 (Order 87-24), § 296-306-27095, filed 11/30/87; Order 76-28, Exhibit B (codified as WAC 296-306-27095), filed 9/28/76.]

**WAC 296-306-275 Seatbelts.** (1) Where ROPS are required by this standard, the employer shall:

(a) Provide each tractor with a seatbelt which meets the requirements of this subsection;

(b) Require that each employee uses such seatbelt while the tractor is moving; and

(c) Require that each employee tightens the seatbelt sufficiently to confine the employee to the protected area provided by the ROPS.

(2) Each seatbelt shall meet the requirements set forth in Society of Automotive Engineers Standard SAE J4C, 1965 Motor Vehicle Seat Belt Assemblies, except as noted hereafter:

(a) Where a suspended seat is used, the seatbelt shall be fastened to the movable portion of the seat to accommodate a ride motion of the operator.

(b) The seatbelt anchorage shall be capable of withstanding a static tensile load of 1,000 pounds (453.6 kg) at 45 degrees to the horizontal equally divided between the anchorages. The seat mounting shall be capable of withstanding this load plus a load equal to four times the weight of all applicable seat components applied at 45 degrees to the horizontal in a forward and upward direction. In addition, the seat mounting shall be capable of withstanding a 500 pound (226.8 kg) belt load plus two times the weight of all applicable seat components both applied at 45 degrees to the horizontal in an upward and rearward direction. Floor and seat deformation is acceptable provided there is not structural failure or release of the seat adjusted mechanism or other locking device.

(c) The seatbelt webbing material shall have a resistance to acids, alkalis, mildew, aging, moisture and sunlight equal to or better than that of untreated polyester fiber.

[Order 76-28, § 296-306-275, filed 9/28/76.]

## PART M--FIELD SANITATION

**WAC 296-306-300 Field sanitation--Scope.** WAC 296-306-300 through 296-306-320 shall apply to any agricultural establishment where one or more employees are engaged on any given hand-labor operations in the field. Except that WAC 296-306-320(3) (Handwashing facilities) and 296-306-320(4) (Toilet facilities) do not apply to employers of workers who:

(1) Are engaged in field activities for the production of grains, seeds, livestock, or livestock feed; or

(2) Use vehicles, machinery, or animals as part of their field activities and, when needed, can transport themselves to and from toilet and handwashing facilities.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 87-09-079 (Order 86-46), § 296-306-300, filed 4/22/87.]

### WAC 296-306-310 Field sanitation--Definitions.

(1) "Agricultural employer" means any person, corporation, association, or other legal entity that owns or operates an agricultural establishment or on whose premises or in whose interest an agricultural establishment is operated and any person, corporation, association, or other

legal entity who is responsible for the management and condition of an agricultural establishment or who acts directly or indirectly in the interest of an employer in relation to any employee.

(2) "Agricultural establishment" is a business operation that uses paid employees in the production of food, fiber, or other materials such as seed, seedlings, plants, or parts of plants.

(3) "Accessible" means no more than one-fourth mile or five minutes travel time from the work location served.

(4) "Hand-labor operations" means agricultural activities or operations performed by hand or with hand tools. Some examples of "hand-labor operations" are the hand cultivation, weeding, planting or harvesting of vegetables, nuts, fruit, seedlings or other crops, including mushrooms, and the hand packing into containers. "Hand-labor" does not include such activities as logging operations, the care or feeding of livestock, or hand-labor operations in permanent structures (e.g., canning facilities or packing houses).

(5) "Handwashing facility" means a facility providing a tap with an adequate supply of water, approved by the local health authority. Soap, single-use hand towels and either a basin or other suitable container for washing shall be provided.

(6) "Potable water" means water that meets the standards for drinking purposes by the state or local authority having jurisdiction or water that meets the quality standards prescribed by the local health authority in accordance with the United States Environmental Protection Agency's National Interim Primary Drinking Water Regulations, published in 40 CFR Part 141.

(7) "Toilet" means a fixed or portable facility designed for the purpose of adequate collection and containment of both defecation and urination. "Toilet" includes biological, chemical, flush and combustion toilets, or sanitary privies.

[Statutory Authority: Chapter 49.17 RCW. 89-11-035 (Order 89-03), § 296-306-310, filed 5/15/89, effective 6/30/89. Statutory Authority: RCW 49.17.040 and 49.17.050. 87-09-079 (Order 86-46), § 296-306-310, filed 4/22/87.]

**WAC 296-306-320 Field sanitation--Requirements.** Agricultural employers shall provide the following for employees engaged in hand-labor operations in the field, without cost to the employee:

(1) Orientation: Orientation shall be given verbally to all employees in a manner readily understandable by each employee and shall include:

(a) Potable water: The location(s) of potable water supplies;

(b) Nonpotable water: Identification of all nonpotable water at the worksite and prohibition of the use of nonpotable water with an explanation of the possible consequences of using nonpotable water;

(c) Handwashing facilities: The location(s) of handwashing facilities with an explanation of when and how they should be used and the consequences of nonuse; and

(d) Toilet facilities: The location(s) of toilet facilities with an explanation of the necessity to use them and to

keep them sanitary as well as the possible consequences of nonuse.

(2) Potable drinking water.

(a) The water shall be provided and shall be placed in locations readily accessible to all employees.

(b) Potable water containers shall be refilled daily or more often as necessary.

(c) Potable water dispensers shall be designed, constructed, and serviced so that sanitary conditions are maintained. They shall be capable of being closed and shall be equipped with a tap.

(d) Open containers such as barrels, pails, or tanks for drinking water from which water must be dipped or poured, whether or not they are fitted with a cover, are prohibited.

(e) Marking: Any container used to distribute drinking water shall be clearly marked, in English and with appropriate international symbol as to the nature of its contents.

(f) Use: Any container used to distribute drinking water shall not be used for any other purpose.

(g) The water shall be suitably cool and in sufficient amounts, taking into account the air temperature, humidity, and the nature of the work performed, to meet employees' needs.

Note: Suitably cool water should be sixty degrees Fahrenheit or less. During hot weather, workers may require up to three gallons of water per day.

(h) The use of common drinking cups or dippers is prohibited. Water shall be dispensed in single-use drinking cups, personal containers, or by water fountains. Single-use drinking cups mean a container of any type or size whether disposable or not, and may include personal containers so long as the option to use a personal container is exercised by the employee, not the employer.

(i) Employees shall not be permitted to drink from irrigation ditches, creeks or rivers. Potable water shall meet the standards for drinking purposes by the state or local authority having jurisdiction or water that meets the quality standards prescribed by the local health department in accordance with the United States Environmental Protection Agency's National Interim Primary Drinking Water Regulations, published in 40 CFR Part 141.

(3) Handwashing facilities.

(a) One handwashing facility, providing a tap with an adequate supply of water, soap, single-use hand towels and either a basin or other suitable container for washing shall be provided for each twenty employees or fraction thereof.

Note: Nonpotable water shall not be used for washing any portion of the person, except as specifically permitted by the health authorities having jurisdiction.

(b) Running water: Each facility shall be provided with running water.

(c) Soap: Each facility shall be provided with a dispenser containing handsoap or a similar cleansing agent.

(d) Towels: Each facility shall be provided with individual single-use hand towels.

(e) Cleanliness: Facilities shall be maintained in a clean and sanitary condition in accordance with appropriate public health sanitation practices.

(f) Waste: Waste receptacles shall be provided. Disposal of wastes from the facilities shall not create a hazard or cause an unsanitary condition.

(g) Reasonable use: Employees shall be allowed reasonable opportunities during the work period to use the facilities.

(h) Location:

(i) Facilities shall be accessibly located in close proximity to toilet facilities and within one-quarter mile of each employee's place of work in the field.

(ii) Where it is not feasible to locate facilities as required by (h)(i) of this subsection, the facilities shall be located at the point of closest vehicular access.

(4) Toilet facilities.

(a) One toilet facility shall be provided for each twenty employees or fraction thereof.

(b) Each employer shall ensure, at the beginning of each day, that the toilets are inspected. If any toilet facility fails to meet the requirements of this section, immediate corrective action shall be taken. Inspections shall be documented and the record shall be maintained at the work site for at least seventy-two hours.

(c) Toilet facilities shall be adequately ventilated; appropriately screened, and have self-closing doors that can be closed and latched from the inside and shall be constructed to ensure privacy.

(d) Cleanliness: Facilities shall be maintained in a clean, sanitary, and functional condition and in accordance with the appropriate public health sanitation practices.

(e) Toilets shall be supplied with toilet paper.

(f) Waste: Disposal of wastes from the facilities shall not create a hazard or cause an unsanitary condition.

(g) Reasonable use: Employees shall be allowed reasonable opportunities during the work period to use the facilities.

(h) Location:

(i) Facilities shall be accessibly located in close proximity to hand washing facilities and within one-quarter mile of each employee's place of work in the field.

(ii) Where it is not feasible to locate facilities as required by (h)(i) of this subsection, the facilities shall be located at the point of closest vehicular access.

[Statutory Authority: Chapter 49.17 RCW. 89-11-035 (Order 89-03), § 296-306-320, filed 5/15/89, effective 6/30/89; 88-23-054 (Order 88-25), § 296-306-320, filed 11/14/88. Statutory Authority: RCW 49.17.040 and 49.17.050. 87-09-079 (Order 86-46), § 296-306-320, filed 4/22/87.]

Chapter 296-310 WAC

FARM LABOR CONTRACTING RULES

WAC	
296-310-010	Definitions.
296-310-020	Application for initial and renewed licenses.
296-310-030	Denial of license.
296-310-040	Requirements for a license to transport employees.
296-310-050	Amount of bond or security.
296-310-060	Fees.

296-310-070	Duplicate licenses.
296-310-080	Length of license period.
296-310-090	Change in business structure, name, address, or number of employees.
296-310-100	Cancellation of insurance or bond.
296-310-110	Refund of security deposited with the department.
296-310-120	Revocation or suspension of license.
296-310-130	Submission of complaint.
296-310-140	Investigation of complaint.
296-310-150	Notice of violation.
296-310-160	Appeal of notices.
296-310-170	Hearing on appeal of notice.
296-310-180	Effect of final decision.
296-310-190	Suit by department for unpaid wages or damages.
296-310-200	Procedures for filing suit against a contractor.
296-310-210	Collection of judgments.
296-310-220	Priority for payment of judgments.
296-310-230	Civil penalties.
296-310-240	Adjustment of controversies.
296-310-250	Filing and service.
296-310-260	Liability of person who uses services of unlicensed contractor.
296-310-270	Inspection of records.

**WAC 296-310-010 Definitions.** For the purposes of this chapter:

(1) "Agricultural employee" means any person who renders personal services to, or under the direction of, an agricultural employer in connection with the employer's agricultural activity.

(2) "Agricultural employer" means any person engaged in agricultural activity, including the growing, producing, or harvesting of farm or nursery products, or engaged in the forestation or reforestation of lands, which includes but is not limited to the planting, transplanting, tubing, precommercial thinning, and thinning of trees and seedlings, the clearing, piling, and disposal of brush and slash, the harvest of Christmas trees, and other related activities.

(3) "Bonded contractor" means a contractor who obtained a surety bond in order to comply with RCW 19.30.030(5).

(4) "Contractor" means a farm labor contractor.

(5) "Department" means the department of labor and industries.

(6) "Director" means the director of the department of labor and industries.

(7) "Employee" means an agricultural employee.

(8) "Farm labor contractor" means any person, or his or her agent or subcontractor, who, for a fee, performs any farm labor contracting activity.

(9) "License" means a farm labor contractor license.

(10) "Secured contractor" means a contractor who assigned a savings account to, or deposited cash or other security with, the department in order to comply with RCW 19.30.030(5).

(11) "Security" means a savings account assigned to, or cash or other security deposited with, the department.

[Statutory Authority: RCW 19.30.130. 86-01-027 (Order 85-34), § 296-310-010, filed 12/11/85.]

**WAC 296-310-020 Application for initial and renewed licenses.** (1) To obtain a license, a contractor must:

(a) Complete an application for a license;

(b) Provide the information required by RCW 19.30.030 (1), (6), and (7);

(c) Obtain a surety bond or provide other acceptable security to the department. If the contractor obtains a bond, it must submit the original bond to the department;

(d) Obtain insurance and supply the information required by WAC 296-310-040(2) if the contractor seeks a license to transport workers; and

(e) Pay the fee set by WAC 296-310-060.

(2) The department shall send a renewal notice to the contractor's last recorded address at least forty-five days before the contractor's license expires. The contractor may renew its license if it submits the renewal notice and provides the materials required in subsection (1)(b), (c), (d) if appropriate, and (e) of this section.

(3) The contractor must submit all materials to the department in one package. Each of the materials must name the contractor exactly as it is named on the application for license or the renewal notice. If the contractor is renewing its license, each of the materials must include the contractor's license number. If any of the materials are missing, do not properly name the contractor, or do not include the license number, the department shall refuse to license or renew the license of the contractor.

(4) The bond and the insurance policy must expire no sooner than the expiration date of the license for which the contractor has applied.

(5) Applications for issuance or renewal of a license must be sent to:

Department of Labor and Industries  
ESAC Division  
General Administration Building  
Olympia WA 98504

[Statutory Authority: RCW 19.30.130. 86-01-027 (Order 85-34), § 296-310-020, filed 12/11/85.]

**WAC 296-310-030 Denial of license.** (1) The department may refuse to issue or renew a license for the reasons listed in RCW 19.30.050 and 19.30.060. If the department refuses a license for any of these reasons, it shall serve on the contractor a notice of denial of license. The notice of denial of license shall:

(a) Describe concisely the ground for denial of the license; and

(b) Specify the statutory authority for the denial.

The notice of denial shall inform the contractor that it may request a hearing pursuant to WAC 296-310-160 on the denial. The notice shall specify that if no hearing is requested within thirty days of the date of issuance of the notice the director shall issue a final, unappealable order denying the license.

(2) The department also shall refuse to issue a license to or renew the license of a contractor who fails to comply with WAC 296-310-020. The department shall inform the contractor of the problem either in writing or, if appropriate, orally. Because compliance with WAC 296-310-020 involves technical requirements that are entirely within the control of the contractor, no hearing shall be granted on a failure to comply.

[Statutory Authority: RCW 19.30.130. 86-01-027 (Order 85-34), § 296-310-030, filed 12/11/85.]

**WAC 296-310-040 Requirements for a license to transport employees.** (1) A contractor who intends to transport employees must obtain liability insurance. The department shall require public liability and property damage insurance that provides coverage, for each single occurrence and for each vehicle used to transport employees, in the following minimum amounts:

- (a) \$50,000 for injury or damage to property;
- (b) \$100,000 for injury or damage, including death, to any one person; and
- (c) \$500,000 for injury or damage, including death, to more than one person.

(2) The contractor must also provide to the department evidence of the insurance policy or policies.

[Statutory Authority: RCW 19.30.130. 86-01-027 (Order 85-34), § 296-310-040, filed 12/11/85.]

**WAC 296-310-050 Amount of bond or security.** (1) A contractor must provide a bond or security in the following minimum amount:

- (a) If the contractor employs or intends to employ:
  - (i) From one to ten employees: \$ 5,000
  - (ii) From eleven to fifty employees: \$10,000
  - (iii) From fifty-one to one hundred employees: \$15,000
  - (iv) Over one hundred employees: \$20,000

(b) If the contractor does not employ agricultural employees, but only recruits, solicits, supplies, transports, or hires employees for another person, and that person takes complete responsibility for payment of wages to the employees, the contractor shall obtain a \$5,000 bond or other security.

(2) If the contractor obtains a two-year license, the bond or security shall be twice the minimum amounts stated in subsection (1) of this section.

(3) The department may order the contractor to obtain a bond or security for an amount greater than the minimums set by subsections (1) and (2) of this section if the security or bond is insufficient to satisfy the contractor's potential liability for the license period. If the department determines that an increased bond is necessary, it shall serve on the contractor a notice to increase bond or security. The notice shall:

(a) Describe concisely the reasons an increase in the bond or security is necessary;

(b) Specify the statutory authority for the required increase; and

(c) Grant the contractor thirty days from the date of issuance of the notice to obtain and provide to the department the increased bond or security.

The notice shall inform the contractor that it may request a hearing pursuant to WAC 296-310-160 on the order to increase the bond or security. The notice shall specify that if no hearing is requested within thirty days of the date of issuance of the notice the director shall issue a final, unappealable order requiring the contractor to submit the increased bond or security. The notice shall also specify that, if the contractor neither appeals

nor obtains the increased bond or security within the thirty days, the department shall suspend the contractor's license.

(4) If the director issues a final, unappealed decision raising the amount of the bond or security, the raised amount shall be required for all license periods after the date of issuance of the final decision unless the decision specifically states otherwise. A contractor may, if the circumstances that led to the increased amount change, file with the department a written petition to lower the amount. The petition shall specify the grounds that justify a lowering of the bond or security. The department shall investigate the petition and shall issue a new notice stating its decision on the bond amount. The contractor, if aggrieved, may appeal this new notice as provided in subsection (3) of this section.

[Statutory Authority: RCW 19.30.130. 86-01-027 (Order 85-34), § 296-310-050, filed 12/11/85.]

**WAC 296-310-060 Fees.** (1) The fee for a one-year license is:

- (a) For a contractor engaged in forestation or reforestation: \$100.00
  - (b) For all other contractors: \$ 35.00
- (2) The fee for a two year license is:
- (a) For a contractor engaged in forestation or reforestation: \$200.00
  - (b) For all other contractors: \$ 70.00

[Statutory Authority: RCW 19.30.130. 86-01-027 (Order 85-34), § 296-310-060, filed 12/11/85.]

**WAC 296-310-070 Duplicate licenses.** If a contractor loses its license, or if the license is stolen or destroyed, the contractor may obtain a duplicate license upon application to the department. The application must specify the reason a duplicate is necessary.

The duplicate license shall be stamped prominently with the word "duplicate." A new contractor license number shall be supplied to the contractor.

[Statutory Authority: RCW 19.30.130. 86-01-027 (Order 85-34), § 296-310-070, filed 12/11/85.]

**WAC 296-310-080 Length of license period.** A contractor who is obtaining its initial license shall be licensed for one year only. A contractor who is renewing its license may choose to obtain either a one-year or two-year license, unless the department informs the contractor that it may obtain only a one-year license.

All one-year licenses shall expire on December 31 of the year of issuance. All two-year licenses shall expire on December 31 of the year following the year of issuance.

[Statutory Authority: RCW 19.30.130. 86-01-027 (Order 85-34), § 296-310-080, filed 12/11/85.]

**WAC 296-310-090 Change in business structure, name, address, or number of employees.** (1) If a contractor changes its business structure (for example, if it changes from a partnership to a corporation, or if the partners in a partnership change), the contractor must apply for a new license in the manner required by WAC

296-310-020. If a contractor does not obtain a new license after a change in its business structure, its previous license may be invalid.

(2) If a contractor changes its name or address, it must notify the department within ten days.

(3) If a contractor begins employing agricultural employees, or increases the number of its employees, so that the bond or security is insufficient for that number of employees, the contractor must obtain a new bond or security in the amount required by WAC 296-310-050 and submit it to the department. The department need not issue a notice to increase the amount of bond or security in this situation.

[Statutory Authority: RCW 19.30.130. 86-01-027 (Order 85-34), § 296-310-090, filed 12/11/85.]

**WAC 296-310-100 Cancellation of insurance or bond.** (1) No surety company may cancel any bond issued to a contractor pursuant to RCW 19.30.040, unless the contractor previously submits another bond or other security, for the same amount, that covers the contractor's liability for the same period as that for the bond that is to be cancelled.

(2) A cancellation of a surety bond or insurance policy is effective thirty days after the department receives the cancellation notice, if the cancellation notice contains the following information:

(a) The name of the contractor, exactly as it appears on the contractor's license;

(b) The contractor's license number;

(c) The contractor's business address;

(d) The number of the bond or insurance policy that is to be cancelled;

(e) The effective date of the bond or insurance policy that is to be cancelled; and

(f) If the cancellation is of a surety bond, a certification that the contractor has previously obtained and submitted to the department a new bond or other security as required by subsection (1) of this section.

(3) To help the department process cancellations, the information in subsection (2) of this section should be provided in the order shown.

(4) The insurance and bonding companies should send cancellation notices to the department by certified or registered mail.

[Statutory Authority: RCW 19.30.130. 86-01-027 (Order 85-34), § 296-310-100, filed 12/11/85.]

**WAC 296-310-110 Refund of security deposited with the department.** (1) If a contractor is secured, the department shall release its interest in the security three years after the contractor's last license expired. The department shall not release its interest, however, if an unsatisfied judgment or claim is outstanding against the contractor.

(2) The department shall in any case release its interest in the security if the contractor provides a surety bond in the same amount that covers all of the periods in which the contractor was licensed for the previous three years, plus for the contractor's current license period if applicable.

[Title 296 WAC—p 2242]

[Statutory Authority: RCW 19.30.130. 86-01-027 (Order 85-34), § 296-310-110, filed 12/11/85.]

**WAC 296-310-120 Revocation or suspension of license.** (1) The department may revoke a contractor's license for the reasons listed in RCW 19.30.050(1) and 19.30.060. If the department revokes a license, it shall serve on the contractor a notice of revocation. The notice of revocation shall:

(a) Describe concisely the ground for the revocation; and

(b) Specify the statutory authority for the revocation.

The notice of revocation shall inform the contractor that it may request a hearing on the revocation. The notice shall specify that if no hearing is requested within thirty days after the date of issuance of the notice, the director shall issue a final, unappealable order revoking the contractor's license. The hearing may be requested pursuant to WAC 296-310-160.

(2) A contractor is entitled to retain its license only if it remains in compliance with the bonding and insurance requirements of RCW 19.30.030 and 19.30.040. If a contractor's surety bond or other security is impaired or becomes insufficient, the contractor's insurance policy is cancelled, or the contractor transports employees without insurance, the department shall suspend the contractor's license until the contractor obtains a new bond, other security, or insurance policy, eliminates the impairment to the bond or security, or ceases to transport workers. The contractor may not do business while its license is suspended.

The department shall inform the contractor in writing of the suspension and of the steps the contractor must take to remove the suspension. The contractor may not appeal a suspension of licensing.

[Statutory Authority: RCW 19.30.130. 86-01-027 (Order 85-34), § 296-310-120, filed 12/11/85.]

**WAC 296-310-130 Submission of complaint.** Any person may submit to the department a complaint alleging a violation of chapter 19.30 RCW or challenging an application for a license. The complaint must describe the alleged violation or ground for denying a license, and must identify the alleged violator or applicant. It would aid the department's investigation if the complaint also specifies:

(1) The name and address of the complainant; and

(2) The address of the alleged violator or applicant.

[Statutory Authority: RCW 19.30.130. 86-01-027 (Order 85-34), § 296-310-130, filed 12/11/85.]

**WAC 296-310-140 Investigation of complaint.** The department shall investigate a complaint unless the complaint was submitted more than three years after the date of the alleged violation. The department shall not investigate any complaint filed more than three years after the date of the violation.

[Statutory Authority: RCW 19.30.130. 86-01-027 (Order 85-34), § 296-310-140, filed 12/11/85.]

**WAC 296-310-150 Notice of violation.** (1) If the department determines that there is reasonable cause to



believe that chapter 19.30 RCW has been violated, the department shall serve on the violator a notice of violation. The notice of violation shall:

- (a) Describe concisely the violation;
- (b) Specify which statute was violated;
- (c) If known, identify the employees who were affected by the violation;
- (d) If known and applicable, state the amount of unpaid wages or damages the violator owes;
- (e) State the penalty, if any, the department will assess for the violation; and
- (f) State whether the contractor's license is being revoked as a result of the violation.

(2) If the notice alleges that the contractor owes unpaid wages or damages, the department shall serve a copy of the notice of violation on the violator's surety bond company.

(3) The notice of violation shall inform the violator and, if applicable, its surety that they may request a hearing on the violation, the amount of unpaid wages or damages owed, or the penalty assessed. The notice shall specify that if no hearing is requested within thirty days after the date the notice was issued the director shall issue a final, unappealable order finding that the violation did occur, ordering the violator to pay any unpaid wages or damages, and assessing penalties.

[Statutory Authority: RCW 19.30.130. 86-01-027 (Order 85-34), § 296-310-150, filed 12/11/85.]

**WAC 296-310-160 Appeal of notices.** (1) The contractor or violator, or the violator's surety if the surety has an interest in the matter, may request a hearing on the matter asserted in a notice of denial of license, a notice of revocation, a notice of increased bond amount, or a notice of violation. One original and four copies of the request must be filed with the director within thirty days after the date the department issued the notice. A party requesting a hearing on a notice of violation must also serve a copy of the request on the surety or the violator as appropriate.

(2) The request for hearing must be in writing and must specify:

- (a) The name and address of the party requesting the hearing;
- (b) The name and date of issuance of the notice that is being appealed;
- (c) The matters contained in the notice that the requestor believes are erroneous;
- (d) The reasons the notice is erroneous; and
- (e) If a surety is appealing a notice of violation, the name and address of the violating contractor.

[Statutory Authority: RCW 19.30.130. 86-01-027 (Order 85-34), § 296-310-160, filed 12/11/85.]

**WAC 296-310-170 Hearing on appeal of notice.** (1) The director may hear an appeal personally or may delegate the authority to hold the hearing and draft a proposed decision to an administrative law judge pursuant to chapter 34.12 RCW. The plaintiff at the hearing shall be the department and the defendants shall be the contractor or the violator and its surety. The department

shall have the burden of proving, by a preponderance of the evidence, that the matters stated in the notice occurred.

(2) Any person who has standing may, upon motion, be allowed to intervene as a plaintiff in a hearing on a notice of violation. Any interested person, whether or not admitted as a plaintiff, may submit written arguments and affidavits in any hearing.

(3) The hearing shall be conducted in accordance with the uniform procedure rules, chapter 1-08 WAC.

(4) If the director presides over the hearing, the director shall issue a final decision that includes findings of fact and conclusions of law and, if appropriate for a violation, an order to pay unpaid wages, damages, or a penalty.

(5) If an administrative law judge presides over the hearing, she or he shall issue a proposed decision that includes findings of fact and conclusions of law and, if appropriate for a violation, an order to pay unpaid wages, damages, or a penalty. The proposed decision shall be served on the contractor or the violator and its surety, the department, and any persons who have intervened as plaintiffs. Any of these parties, if aggrieved by the proposed decision, may appeal to the director within thirty days after the date of issuance of the proposed decision. If none of the parties appeals within thirty days, the proposed decision may not be appealed either to the director or the courts. A copy of the proposed decision shall also be mailed to all persons who submitted written arguments or affidavits at the hearing.

(6) An appellant must file with the director an original and four copies of its notice of appeal. The notice of appeal must specify which findings and conclusions are erroneous. The appellant must attach to the notice the written arguments supporting its appeal.

The appellant must serve a copy of the notice of appeal and the arguments on the other parties. The respondent parties must file with the director their written arguments within thirty days after the date the notice of appeal and the arguments were served upon them.

(7) The director shall review the proposed decision in accordance with the Administrative Procedure Act, chapter 34.04 RCW. The director may: Require the parties to specify the portions of the record on which the parties rely; require the parties to submit additional information by affidavit or certificate; remand the matter to the administrative law judge for further proceedings; and require a department employee to prepare a summary of the record for the department to review. The director may allow the parties to present oral arguments as well as the written arguments. The director shall issue a final decision that can affirm, modify, or reverse the proposed decision.

(8) The director shall serve the final decision on all parties. Any aggrieved party may appeal the final decision to superior court pursuant to RCW 34.04.130 unless the final decision affirms an unappealed proposed decision. If no party appeals within the period set by RCW 34.04.130, the director's decision is conclusive and binding on all parties. The director shall also mail a

copy of the final decision to all persons who submitted written arguments or affidavits at the hearing.

[Statutory Authority: RCW 19.30.130. 86-01-027 (Order 85-34), § 296-310-170, filed 12/11/85.]

**WAC 296-310-180 Effect of final decision.** If the director issues a final decision that includes a finding that a violator owes unpaid wages or damages, and the finding is not appealed or is affirmed by the courts, the finding and the decision are res judicata in any action by the department, or by any other person who was a plaintiff at the hearing, against the violator and its surety to recover the unpaid wages or damages. The finding and decision are not res judicata in any action by a person who was not a party at the hearing.

[Statutory Authority: RCW 19.30.130. 86-01-027 (Order 85-34), § 296-310-180, filed 12/11/85.]

**WAC 296-310-190 Suit by department for unpaid wages or damages.** (1) RCW 19.30.160(4) authorizes the department to sue a violator and its surety on behalf of an employee to recover unpaid wages and other damages. The department is not required to bring suit and, in its sole discretion, may decide not to do so in any case. The department also shall not sue on behalf of any employee who has already brought a suit against the violator and its surety in the matter.

(2) The department may file a suit against the violator and its surety at any time and without regard to whether administrative proceedings have been exhausted.

(3) The department may include in any suit a request for an injunction against the violator.

[Statutory Authority: RCW 19.30.130. 86-01-027 (Order 85-34), § 296-310-190, filed 12/11/85.]

**WAC 296-310-200 Procedures for filing suit against a contractor.** (1) A suit against a contractor and its bond or security for unpaid wages or damages may be brought in any court with jurisdiction. The venue may be in the county in which the claim arose, or in which either the damaged person or the defendant resides.

(2) When a contractor is sued, the plaintiff must serve the summons and complaint on the contractor and its surety by serving three copies of the summons and complaint by certified or registered mail on the department. The department shall not accept personal service of the summons and complaint.

(3) The department may be unable to process a summons and complaint if the summons and complaint do not contain the following information:

- (a) The contractor's name exactly as it appears on the contractor's license;
- (b) The contractor's business address;
- (c) The names of the owners, partners, or officers of the contractor; and
- (d) The contractor's license number.

If the suit names a surety as a defendant, the summons and complaint should also include:

- (e) The name and address of the surety that issued the contractor's bond;

- (f) The bond number; and

- (g) The effective date of the bond.

If the information is insufficient for the department to identify the contractor or surety that is being sued, the department shall not attempt to serve the summons and complaint and shall return them to the plaintiff.

[Statutory Authority: RCW 19.30.130. 86-01-027 (Order 85-34), § 296-310-200, filed 12/11/85.]

**WAC 296-310-210 Collection of judgments.** (1) If a contractor is secured, a plaintiff who has received a final judgment against a contractor may satisfy the judgment out of the security held by the department.

(2) The department shall satisfy a final judgment if the plaintiff serves on the department three certified copies of the unsatisfied judgment. The plaintiff must include the following information with the copies of the judgment:

- (a) The name of the contractor, exactly as it appears on the contractor's license;
- (b) The contractor's business address;
- (c) The names of the owners, partners, or officers of the contractor;
- (d) The contractor's license number; and
- (e) The exact amount of the judgment awarded by the court, including attorney's fees and interest.

If the department does not receive sufficient information to enable it to pay the judgment, it shall inform the plaintiff that more information is needed.

(3) If a contractor is bonded, a plaintiff can satisfy a final judgment only against the contractor or the bonding company. The department can neither satisfy the judgment nor, unless the department itself is the plaintiff, force the contractor or the bonding company to pay the judgment. The plaintiff must join the bonding company in the suit if it wants the bonding company to pay the judgment.

[Statutory Authority: RCW 19.30.130. 86-01-027 (Order 85-34), § 296-310-210, filed 12/11/85.]

**WAC 296-310-220 Priority for payment of judgments.** RCW 19.30.170 contains two different provisions for priority in paying judgments from the contractor's bond or security.

(1) If a contractor is secured, the department shall satisfy final judgments against the contractor in the order the department receives the judgments.

(2) If a contractor is bonded, claims for unpaid wages and benefits are satisfied first, claims for damages are satisfied second, and claims for costs and attorney's fees are satisfied last. No claim in a lesser category may be satisfied until all pending claims in the preceding categories are satisfied, unless the total amount of all pending claims in the preceding categories is less than the amount of the bond that remains unimpaired.

[Statutory Authority: RCW 19.30.130. 86-01-027 (Order 85-34), § 296-310-220, filed 12/11/85.]

**WAC 296-310-230 Civil penalties.** (1) In determining the amount of any civil penalty to be imposed under

RCW 19.30.160 the department shall consider the following factors:

- (a) Previous violations by the violator;
- (b) The history of the violator in taking all necessary measures to prevent or correct violations;
- (c) The magnitude and seriousness of the violation;
- (d) The remedial purpose of chapter 19.30 RCW;
- (e) Any mitigating circumstances; and
- (f) Any other factors the department considers relevant.

(2) It is the violator's responsibility to inform the department of mitigating evidence.

(3) The penalties for acting as a contractor without a license, or for transporting employees without an endorsement to do so, are:

- (a) Up to \$500 for the first violation;
- (b) Up to \$750 for the second violation; and
- (c) Up to \$1000 for the third and any further violations.

[Statutory Authority: RCW 19.30.130. 86-01-027 (Order 85-34), § 296-310-230, filed 12/11/85.]

**WAC 296-310-240 Adjustment of controversies.** (1) Upon receipt of a complaint or on its own motion, the department shall attempt to adjust equitably a controversy between a contractor and its employees.

(2) No particular form of proceeding is necessary for resolving disputes. The supervisor of employment standards shall, in each case, use his or her best judgment in designing a procedure. However, in every case in which the supervisor determines that a hearing should be held, the supervisor shall notify the affected persons, or their representatives, of the time, date, place, and purpose of the hearing.

(3) A hearing shall be informal and shall not be subject to chapter 34.04 RCW. The supervisor's suggestions for resolution are advisory and not binding, and may not be appealed to any person or court.

(4) The director may delegate the resolution of any particular case to a person other than the supervisor of employment standards. That person shall have the same authority as the supervisor to determine the form of the proceeding.

[Statutory Authority: RCW 19.30.130. 86-01-027 (Order 85-34), § 296-310-240, filed 12/11/85.]

**WAC 296-310-250 Filing and service.** All papers required to be filed with the director under this chapter or chapter 19.30 RCW shall be addressed to Director, Department of Labor and Industries, General Administration Building, Olympia, WA 98504.

Filing and service may be made as provided in WAC 1-08-090 through 1-08-140.

[Statutory Authority: RCW 19.30.130. 86-01-027 (Order 85-34), § 296-310-250, filed 12/11/85.]

**WAC 296-310-260 Liability of person who uses services of unlicensed contractor.** (1) A person who knowingly uses the services of an unlicensed contractor

is liable for unpaid wages, damages, and civil and criminal penalties to the same extent as the unlicensed contractor.

(2) Pursuant to RCW 19.30.200, a person may prove lack of knowledge by proving that she or he relied on a license issued by the department under chapter 19.30 RCW, or upon the department's representation that the contractor was licensed. The department shall not make oral representations that a contractor is or is not licensed. All representations by the department that a contractor is licensed shall be made in writing and shall be signed by the director or the employment standards supervisor or the assistant director. The department shall not accept reliance on a supposed oral representation as proof in any administrative enforcement proceeding.

[Statutory Authority: RCW 19.30.130. 86-01-027 (Order 85-34), § 296-310-260, filed 12/11/85.]

**WAC 296-310-270 Inspection of records.** A contractor or any person using a contractor's services shall allow a representative of the department to inspect at any reasonable time the records it is required to keep by chapter 19.30 RCW.

[Statutory Authority: RCW 19.30.130. 86-01-027 (Order 85-34), § 296-310-270, filed 12/11/85.]

## Chapter 296-350 WAC

### REASSUMPTION OF JURISDICTION PURSUANT TO RCW 49.17.140

#### WAC

- 296-350-010 Definitions.
- 296-350-020 Reassumption of jurisdiction—Purpose.
- 296-350-030 Notice of appeal—Filing and service.
- 296-350-040 Notice of appeal—Contents.
- 296-350-050 Reassumption of jurisdiction—Time—Notice of reassumption of jurisdiction and informal conference.
- 296-350-060 Notices of reassumption of jurisdiction and informal conferences—Service—Posting record.
- 296-350-070 Reassumption of jurisdiction—Informal conferences—Procedure—Evidence.
- 296-350-080 Reassumption of jurisdiction—Final determination—Mailing.
- 296-350-090 Reassumption of jurisdiction—Statement of redetermination—Appeal.
- 296-350-095 Settlement agreements.
- 296-350-200 Variances—Foreword.
- 296-350-210 Types of orders granting a variance.
- 296-350-230 Effect of variances.
- 296-350-240 Variance applications—Form of documents—Subscription.
- 296-350-250 Order granting a temporary variance—Application.
- 296-350-255 Order granting a permanent variance—Application.
- 296-350-260 Interim order—Application—Notice of grant.
- 296-350-270 Notice of denial of application for variance.
- 296-350-280 Hearings on applications for variances—Temporary and permanent.
- 296-350-300 Repeat violations.
- 296-350-350 Extension of abatement date(s)—Application—Authority.
- 296-350-35010 Application for extension of abatement date(s).
- 296-350-35015 Extension of abatement date(s)—Application—Timeliness.
- 296-350-35020 Extension of abatement date(s)—Application—Service.
- 296-350-35025 Extension of abatement date(s)—Application—Contents.

- 296-350-35030 Extension of abatement date(s)—Provisional determination.
- 296-350-35035 Extension of abatement date(s)—Notice of application—Notice of opportunity for hearing—Notice of provisional determination.
- 296-350-35040 Extension of abatement date(s)—Posting.
- 296-350-35045 Extension of abatement date(s)—Application for hearing.
- 296-350-35050 Extension of abatement date(s)—Notice of hearing.
- 296-350-35055 Extension of abatement date(s)—Hearings.
- 296-350-35060 Extension of abatement date(s)—Decision and order.
- 296-350-400 Posting of notices—Posting of citation and notice—Availability of act and applicable standards.
- 296-350-450 Complaints by employees or their representatives.
- 296-350-460 Complaints—Inspection not warranted—Informal review.
- 296-350-470 Citation not issued following complaint.
- 296-350-500 Citation and notice—Copy to employee representative.
- 296-350-990 Appendix A—Form F418-023-000—Application for copies of citations and notices.

**WAC 296-350-010 Definitions.** (1) The definitions and interpretations of RCW 49.17.020 shall apply to the provisions of this chapter unless the context of the provision clearly requires otherwise.

(2) "Presiding officer" means that person designated by the director as being responsible for the conducting of the informal conference provided for in RCW 49.17.140(3) and WAC 296-350-070.

(3) "Act" means the Washington Industrial Safety and Health Act (chapter 80, Laws of 1973; chapter 49.17 RCW) as now or hereafter amended.

(4) "Assistant director" shall mean the assistant director of industrial safety and health of the department, or his designated representative.

(5) "Citation" shall mean that CITATION issued to an employer in accordance with the provisions of RCW 49.17.120, otherwise known as a CITATION AND NOTICE. (Form No. WISHERS-110.)

(6) "Abatement date" shall mean the date identified as such on the CITATION. The "abatement date" is the date by which the condition identified in the CITATION must be brought into compliance with the cited safety and health standard.

(7) "Division" shall mean the division of industrial safety and health of the department.

[Statutory Authority: RCW 49.17.040, 49.17.050, 49.17.240, chapters 42.30 and 43.22 RCW. 80-17-014 (Order 80-20), § 296-350-010, filed 11/13/80; Order 75-14, § 296-350-010, filed 4/14/75; Order 74-21, § 296-350-010, filed 5/6/74.]

**WAC 296-350-020 Reassumption of jurisdiction—Purpose.** The purpose of the department's reassuming jurisdiction over all or any part of the subject matter of a notice of appeal, as authorized by RCW 49.17.140(3), is to afford an opportunity for those parties authorized to file such a notice of appeal to present relevant and material facts, opinions and other relevant and material information, material or data to the department in support of or in opposition to the subject matter of the appeal.

[Order 75-14, § 296-350-020, filed 4/14/75; Order 74-21, § 296-350-020, filed 5/6/74.]

[Title 296 WAC—p 2246]

**WAC 296-350-030 Notice of appeal—Filing and service.** Any party authorized to appeal from an action of the department as set forth in RCW 49.17.140(3), may do so by filing a notice of appeal in writing in the recommended manner and containing the recommended subject matter as hereinafter set forth with fifteen working days of the communication of the notice, by serving a copy of such notice of appeal either in person or by mail upon the assistant director of the Division of Industrial Safety and Health, 814 E. 4th Avenue, Olympia, Washington 98504.

[Statutory Authority: RCW 49.17.040, 49.17.050, 49.17.240, chapters 42.30 and 43.22 RCW. 80-17-014 (Order 80-20), § 296-350-030, filed 11/13/80; Order 75-14, § 296-350-030, filed 4/14/75; Order 74-21, § 296-350-030, filed 5/6/74.]

**WAC 296-350-040 Notice of appeal—Contents.** In order to expedite the decision of the department as to whether to reassume jurisdiction over the subject matter of the appeal and in order to facilitate the certification of the notice of appeal and department file to the board of industrial insurance appeals, if appropriate, the notice of appeal should contain:

(1) The name and address of the appealing party and his representative, if any;

(2) The place where the alleged safety violation occurred;

(3) A statement identifying the order, decision or citation appealed from by report number and date of issuance.

(4) The grounds upon which the appealing party considers such order, decision or citation to be unjust or unlawful;

(5) A statement of facts in support of each grounds stated;

(6) The relief sought, including the specific nature and extent;

(7) A statement that the person signing the notice of appeal has read it and to the best of his knowledge, information and belief there is good ground to support it. A notice of appeal may be signed by the party or by his authorized representative.

[Order 75-14, § 296-350-040, filed 4/14/75; Order 74-21, § 296-350-040, filed 5/6/74.]

**WAC 296-350-050 Reassumption of jurisdiction—Time—Notice of reassumption of jurisdiction and informal conference.** After receipt of a notice of appeal filed pursuant to RCW 49.17.140(3), and these rules, the department after investigation of the allegations contained in the notice of appeal, and not later than five working days from the date of receipt of such notice of appeal, shall make a determination to reassume jurisdiction over the subject matter of the appeal or, in the alternative, certify the record of the department which is the subject of appeal to the board of industrial insurance appeals along with such notice of appeal. If the department determines to reassume jurisdiction over the subject matter of the appeal, a NOTICE OF REASSUMPTION OF JURISDICTION and a NOTICE OF INFORMAL CONFERENCE shall be issued giving notice that jurisdiction has been reassumed

(1989 Ed.)

and that an opportunity will be afforded to all appealing parties as well as other interested parties as prescribed in RCW 49.17.140(3), to participate in an informal conference and that any redetermination and corrective notices will be completed not later than thirty working days following the date that the determination to reassume jurisdiction was made. The notice of informal conference shall give notice of the time, date and place at which such informal conference is to be conducted. The NOTICE OF REASSUMPTION OF JURISDICTION AND INFORMAL CONFERENCE may be combined on one document and issued as a single notice.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 86-16-008 (Order 86-27), § 296-350-050, filed 7/25/86; Order 76-6, § 296-350-050, filed 3/1/76; Order 75-14, § 296-350-350 (codified as WAC 296-350-050), filed 4/14/75; Order 74-21, § 296-350-050, filed 5/6/74.]

**WAC 296-350-060 Notices of reassumption of jurisdiction and informal conferences--Service--Posting record.** Either the original or copies of the notice of reassumption of jurisdiction and the notice of informal conferences shall be forwarded by certified mail to all parties, or their representatives, with a copy to the employer at the premises of the employer affected by the appeal which shall be posted by the employer in a place or places reasonably accessible to all affected employees. In addition to the written notice of informal conference and reassumption of jurisdiction, the department may give telephonic or telegraphic notice of the time, date and place for any informal conference. The notice of informal conference shall in all cases advise that all appealing parties, as well as affected employees and representatives of affected employees, may either orally, or in writing, not later than the date fixed for such conference object to or support the subject matter of the reassumption of jurisdiction by the department. Informal conferences will ordinarily be held at the district office of the department most convenient to the appealing parties. The information presented by the participants at the informal conference and the arguments of the respective parties objecting to or supporting the subject matter of the reassumption of jurisdiction by the department shall be recorded either manually or by a mechanical device. Documentary or other types of physical materials presented at the informal conference shall be made a part of the record of the informal conference.

[Order 75-14, § 296-350-060, filed 4/14/75; Order 74-21, § 296-350-060, filed 5/6/74.]

**WAC 296-350-070 Reassumption of jurisdiction--Informal conferences--Procedure--Evidence.** (1) The director shall designate personnel of the staff of the division of industrial safety and health to act as presiding officers at informal conferences.

(2) A presiding officer shall be present and preside over the proceedings at all informal conferences conducted. He may be accompanied by an assistant attorney general who shall be able to render legal advice to the presiding officer. The assistant attorney general may, at the presiding officer's request, preside over the proceedings.

(1989 Ed.)

(3) Prior to the commencement of the informal conference, the presiding officer may confer with the parties to the informal conference concerning the material to be presented for the record in order to determine an orderly method of procedure. The designated presiding officer may admit and give probative effect to evidence which possesses probative value commonly accepted by reasonably prudent men in the conduct of their affairs. Effect shall be given to the rules of privilege recognized by law. The presiding officer may exclude incompetent, irrelevant, immaterial and unduly repetitious evidence. Documentary evidence may be received in the form of copies of excerpts or by incorporation in the record by reference. Every party shall have the right to ask questions of other parties present. The designated presiding officer may take notice of judicially cognizable facts and in addition may take notice of general, technical, or scientific facts within the specialized knowledge of the department's officers relating to industrial safety and health.

[Order 75-14, § 296-350-070, filed 4/14/75; Order 74-21, § 296-350-070, filed 5/6/74.]

**WAC 296-350-080 Reassumption of jurisdiction--Final determination--Mailing.** (1) Immediately following the informal conference the presiding officer shall complete a status report of the reassumption of jurisdiction which shall include a summary of findings and conclusions and shall state therein the redetermination and final decision of the department. The presiding officer shall then complete and submit those documents which are necessary for the expeditious processing of these redeterminations and final decisions such that all corrective abatement, relating to the subject matter of the reassumption of jurisdiction, can be issued by the department within thirty working days of the determination to reassume jurisdiction over the subject matter of the appeal.

(2) Corrective notices issued following reassumption of jurisdiction shall be forwarded by certified mail or personal delivery or service. Upon receipt of a corrective notice of redetermination issued by the department pursuant to RCW 49.17.140(3), the employer shall immediately post the corrective notice of redetermination or a copy thereof in a prominent place at or near each place a violation referred to in the corrective notice of redetermination occurred. The corrective notice of redetermination or a copy thereof shall remain posted as required by this section until the violation(s) have been abated, or for three working days, whichever is longer.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 86-16-008 (Order 86-27), § 296-350-080, filed 7/25/86; 82-13-045 (Order 82-22), § 296-350-080, filed 6/11/82; Order 76-6, § 296-350-080, filed 3/1/76; Order 75-14, § 296-350-080, filed 4/14/75; Order 74-21, § 296-350-080, filed 5/6/74.]

**WAC 296-350-090 Reassumption of jurisdiction--Statement of redetermination--Appeal.** All corrective notices of assessment of penalty, citations or revised periods of abatement shall include a statement identifying the notice as having been issued according to the provisions of RCW 49.17.140(3) and that any appeal thereto

[Title 296 WAC--p 2247]

must be made to the board of industrial insurance appeals, with a copy of the notice of appeal to be served on the department, within fifteen working days of the communication of the corrective notice, or the same shall be deemed a final order of the department and not subject to review by any court or agency.

[Order 75-14, § 296-350-090, filed 4/14/75; Order 74-21, § 296-350-090, filed 5/6/74.]

**WAC 296-350-095 Settlement agreements.** (1) Every settlement agreement in an appeal to the board of industrial insurance appeals shall contain a statement of the abatement date for the cited condition or a statement that the condition has been abated. If any settlement agreement lacks a statement of abatement date, the department shall assign an abatement date to the condition which allows the same amount of time for abatement as was allowed by the original abatement date; the amount of time for abatement shall be figured from the date that the board of industrial insurance appeals issues its order adopting the settlement agreement.

(2) Every settlement agreement shall contain a statement that payment of any penalty has been tendered or a statement of a promise to pay any penalty.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 82-13-045 (Order 82-22), § 296-350-095, filed 6/11/82.]

**WAC 296-350-200 Variances--Foreword.** WAC 296-350-200 through 296-350-280 contain rules pursuant to which employers may apply for departmental orders granting variances from industrial safety and health standards in accordance with the provisions of RCW 49.17.080 and 49.17.090. Also included are rules on procedures to be followed by the director or his authorized representatives following the receipt of such an application for an order granting a variance.

[Order 75-14, § 296-350-200, filed 4/14/75.]

**WAC 296-350-210 Types of orders granting a variance.** (1) Section 8 (RCW 49.17.080) and section 9 (RCW 49.17.090) of the Washington Industrial Safety and Health Act (chapter 80, Laws of 1973) provide for the granting of two types of orders granting a variance from industrial safety and health standards administered according to that chapter.

(2) RCW 49.17.080 authorizes the issuance of an order granting a variance (temporary) from any safety and health standard promulgated under the authority of the act upon proper application by the employer and sufficient showing by the applicant employer that the applicant employer is unable to comply with a safety and health standard because of unavailability of professional or technical personnel or materials and equipment needed to come into compliance with the safety and health standard or because necessary construction or alteration of facilities cannot be accomplished by the effective date of the standard, and that the employer is taking all available steps to safeguard his employees against the hazards covered by the safety and health standard and that the employer has an effective program

for coming into compliance with the safety and health standard as quickly as practicable.

(3) RCW 49.17.090 authorizes the issuance of an order granting a variance (permanent) from any safety and health standard promulgated under the authority of the act upon proper application by the employer and sufficient showing by the applicant employer that the conditions, practices, means, methods, operations or processes used or proposed to be used by such applicant employer will provide employment and places of employment to his employees which are as safe and healthful as those which would prevail if the employer complied with the safety and health standard or standards from which the variance is sought.

[Order 75-14, § 296-350-210, filed 4/14/75.]

**WAC 296-350-230 Effect of variances.** All variances granted pursuant to the provisions of this chapter shall have only future effect. In his discretion, the director or his authorized representative may decline to entertain an application for a variance on a subject or issue concerning which a citation has been issued to the employer involved and a proceeding on the citation or a related issue concerning a proposed penalty or period of abatement is pending before the board of industrial insurance appeals, or an appropriate court, until the completion of such proceeding.

[Order 75-14, § 296-350-230, filed 4/14/75.]

**WAC 296-350-240 Variance applications--Form of documents--Subscription.** (1) No particular form is prescribed for applications and other papers which may be filed in proceedings relating to the application for an order granting a variance. However, any applications and other papers shall be clearly legible. Department forms for application for a variance may be used and may be obtained from the Division of Industrial Safety and Health, Department of Labor and Industries, Olympia, Washington; or other offices of that division.

(2) Each application or other paper which is filed in proceedings relating to the application for an order granting a variance under this chapter shall be subscribed by the person filing the same or by his attorney or other authorized representative.

[Order 75-14, § 296-350-240, filed 4/14/75.]

**WAC 296-350-250 Order granting a temporary variance--Application.** (1) Application for a temporary variance. Any employer, or class of employers, desiring a variance from a standard, or portion thereof, authorized by section 8 of the act (RCW 49.17.080) may file a written application containing the information specified in this section with the Supervisor of Industrial Safety and Health, P.O. Box 207, Olympia, Washington 98504.

(2) Contents. An application filed pursuant to subsection (1) of this section shall include:

(a) The name(s) and address(es) of the applicant or applicants;



(b) The address(es) of the place or places of employment involved;

(c) A specification of the standard or portion thereof from which the applicant(s) seek(s) a variance; to include a reference to the appropriate code section or sections;

(d) A representation by the applicant(s) supported by representations from a qualified person or persons having firsthand knowledge of the facts represented, that he (they) is (are) unable to comply with the standard(s) or portion(s) thereof by its effective date and a detailed statement of the reasons therefor;

(e) A statement of the steps the applicant(s) has (have) taken and will take, with specific dates where appropriate, to protect employees against the hazard covered by the standard;

(f) A statement of when the applicant(s) expect(s) to be able to comply with the standard and of what steps he (they) has (have) taken and will take, with specific dates where appropriate, to come into compliance with the standard;

(g) A statement of the facts the applicant(s) would show to establish that:

(i) The applicant(s) is (are) unable to comply with a standard by its effective date because of unavailability of professional or technical personnel or materials and equipment needed to come into compliance with the standard or because necessary construction or alteration of facilities cannot be completed by the effective date of the standard from which the variance is sought;

(ii) He (they) is (are) taking all available steps to safeguard his employees against the hazards covered by the standard; and

(iii) He (they) has (have) an effective program for coming into compliance with the standard as quickly as practicable;

(h) Any request for a hearing, as provided in WAC 296-350-280;

(i) A statement that the applicant(s) has (have) informed his (their) affected employees of the application by giving a copy thereof to their authorized representative, posting a statement, giving a summary of the application and specifying where a copy may be examined, at the place or places where notices to employees are normally posted, and by other appropriate means; and

(j) A description of how affected employees have been informed of the application and of their right to petition the director for a hearing.

[Order 75-14, § 296-350-250, filed 4/14/75.]

**WAC 296-350-255 Order granting a permanent variance--Application.** (1) Application for a permanent variance. Any employer, or class of employers, desiring a variance authorized by section 9 of the act (RCW 49.17.090) may file a written application containing the information specified in this section with the assistant director of Industrial Safety and Health, P.O. Box 207, Olympia, Washington 98504.

(2) Contents. An application filed pursuant to subsection (1) of this section shall include:

(a) The name(s) and address(es) of the applicant or applicants;

(b) The address(es) of the place or places of employment involved;

(c) A specification of the standard or portion thereof from which the applicant(s) seek(s) a variance; to include a reference to the appropriate code section or sections;

(d) A description of the conditions, practices, means, methods, operations, or processes used or proposed to be used by the applicant or applicants;

(e) A statement showing how the conditions, practices, means, methods, operations, or processes used or proposed to be used would provide employment and places of employment to employees which are as safe and healthful as those required by the standard from which a variance is sought;

(f) A certification that the applicant(s) has (have) informed his/her (their) employees of the application by:

(i) Giving a copy thereof to their authorized representative;

(ii) Posting a statement giving a summary of the application and specifying where a copy may be examined, at the place or places where notices to employees are normally posted (or in lieu of such summary, the posting of the application itself); and

(iii) By other appropriate means.

(g) Any request for a hearing, as provided in WAC 296-350-280; and

(h) A description of how employees have been informed of the application and of their right to petition the director for a hearing.

[Statutory Authority: RCW 49.17.040, 49.17.050, 49.17.240, chapters 42.30 and 43.22 RCW, 80-17-014 (Order 80-20), § 296-350-255, filed 11/13/80; Order 75-14, § 296-350-255, filed 4/14/75.]

**WAC 296-350-260 Interim order--Application--Notice of grant.** (1) An application may also be made for an interim order to be effective until a decision is rendered on the application for the variance filed previously or concurrently. An application for an interim order may include statements of fact and arguments as to why the order should be granted. The director or his authorized representatives may rule ex parte upon the application.

(2) If an interim order is granted, a copy of the order shall be served upon the applicant(s) for the order and other parties. It shall be a condition of the order that the employer(s) shall give notice thereof to affected employees by the same means to be used to inform them of an application for a variance.

[Order 75-14, § 296-350-260, filed 4/14/75.]

**WAC 296-350-270 Notice of denial of application for variance.** If an application for a variance filed pursuant to this chapter is denied, the applicant shall be given prompt notice of the denial, which shall include, or be accompanied by a brief statement of the grounds therefor.

[Order 75-14, § 296-350-270, filed 4/14/75.]



**WAC 296-350-280 Hearings on applications for variances—Temporary and permanent.** (1) Any affected employee or employees, or an authorized representative of affected employees may request of the assistant director of industrial safety and health that a hearing be held on the application for a temporary or permanent variance.

(2) The employer applicant(s) or his/her (their) representative may request of the assistant director of industrial safety and health that a hearing be held on the application for a temporary or permanent variance.

(3) Requests for hearings authorized by section 8 and 9 of the act (RCW 49.17.080 and 49.17.090) and subsections (1) and (2) of this section shall be in writing, signed by the applicant(s), and must be received by the assistant director of industrial safety and health within twenty-one calendar days of the date of the application for a variance.

(4) After receipt of a request for a hearing filed pursuant to these rules, the department, not later than ten working days from the date of the receipt of such request, shall issue a notice of hearing advising that the opportunity will be afforded to all interested parties as prescribed in this section to participate in a hearing on the application for a variance. The notice of hearing shall fix the time for such hearing, such that the affected parties can reasonably be expected to receive the NOTICE OF HEARING not less than twenty days in advance of the date set for the hearing, and shall indicate the time, date and place at which such hearing is to be conducted. Such notice of hearing shall be immediately communicated to affected employees by giving a copy thereof to their authorized representative and posting a copy thereof with the application for a variance or a summary of said application as prescribed in WAC 296-350-250 (2)(i) or (2)(f). In addition to the forwarding of the notice of hearing, the department may give telephonic or telegraphic notice of the time, date and place for any such hearing.

(5) The director shall designate personnel of the staff of the division of industrial safety and health to act as presiding officers at hearings on applications for variances.

(6) The duties of the presiding officer include but are not limited to the following:

(a) A presiding officer shall be present and preside over the proceedings at all hearings conducted. He/she may be accompanied by an assistant attorney general who shall be able to render legal advice to the presiding officer. The assistant attorney general may, at the presiding officer's request, preside over the proceedings.

(b) Prior to the commencement of the hearing, the presiding officer may confer with the parties attending the hearing concerning the material to be presented for the record in order to determine an orderly method of procedure. The designated presiding officer may admit and give effect to evidence which possesses probative value commonly accepted by reasonably prudent people in the conduct of their affairs. Effect shall be given to the rules of privilege recognized by law. The presiding officer may exclude incompetent, irrelevant, immaterial

and unduly repetitious evidence. Documentary evidence may be received in the form of copies of exhibits or by incorporation in the record by reference. Every party shall have the right to ask questions of other parties present. The designated presiding officer may take notice of judicially cognizable facts, and in addition may take notice of general, technical or scientific facts within the specialized knowledge of the department's officers relating to industrial safety and health.

(c) All proceedings relating to a hearing under this section shall be recorded mechanically or otherwise. Copies of transcripts of such recordings will be made available to any party at cost upon request of the party.

[Statutory Authority: RCW 49.17.040, 49.17.050, 49.17.240, chapters 42.30 and 43.22 RCW. 80-17-014 (Order 80-20), § 296-350-280, filed 11/13/80; Order 75-14, § 296-350-280, filed 4/14/75.]

**WAC 296-350-300 Repeat violations.** (1)(a) "Repeat violation" includes any violation of a standard or order when a violation has previously been cited to the same employer which identifies the same type of hazard.

(b) "Nonabatement violation" includes any repeat violation which has not been corrected by the assigned abatement date.

(2) For a period of three years following the issuance of a final order which cites any violation of a safety standard, order or RCW 49.17.060, the department may issue a citation for a repeat violation. A repeat violation may incur a penalty based solely upon the repeat nature of the violation, without regard to the seriousness of the hazard being cited.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 86-06-002 (Order 86-17), § 296-350-300, filed 2/20/86.]

**WAC 296-350-350 Extension of abatement date(s)—Application—Authority.** All sections of this chapter which include WAC 296-350-350 in the section number apply to the request of extension of abatement dates in accordance with the provisions of RCW 49.17.140(3), which reads in pertinent part:

"Upon application by an employer showing that a good faith effort to comply with the abatement requirements of a citation has been made and that the abatement has not been completed because of factors beyond his control, the director after affording an opportunity for a hearing shall issue an order affirming or modifying the abatement requirements in such citation."

[Order 75-14, § 296-350-350, filed 4/14/75.]

**WAC 296-350-35010 Application for extension of abatement date(s).** Applications for extensions of abatement dates shall be submitted in writing by the employer, or his representative, whose workplace is the subject of the CITATION containing the abatement date for which the extension(s) is (are) sought. Subject to the provisions of WAC 296-350-35015, applications received by telephone or personal nonwritten communication may be acted upon by the assistant director.

[Statutory Authority: RCW 49.17.040, 49.17.050, 49.17.240, chapters 42.30 and 43.22 RCW. 80-17-014 (Order 80-20), § 296-350-35010,

filed 11/13/80; Order 76-29, § 296-350-35010, filed 9/30/76; Order 75-14, § 296-350-35010, filed 4/14/75.]

**WAC 296-350-35015 Extension of abatement date(s)—Application—Timeliness.** (1) An application for the extension of an abatement date, or abatement dates, shall be considered a timely application if it is served on the division at any time prior to midnight of the abatement date for which the extension is sought.

(2) A later-filed application may be acted upon by the division if it is received by the division within five days following the relevant abatement date(s) and is accompanied by the employer's written statement of exceptional circumstances explaining the delayed filing: *Provided*, That such later-filed application shall not be acted upon if the department has initiated compliance activity regarding the relevant abatement date(s) prior to the receipt of the later-filed application for extension.

[Order 76-29, § 296-350-35015, filed 9/30/76; Order 75-14, § 296-350-35015, filed 4/14/75.]

**WAC 296-350-35020 Extension of abatement date(s)—Application—Service.** Service of the application may be accomplished by postage prepaid first class mail or by personal delivery. Service is deemed effected at the time of mailing (if by mail) or at the time of personal delivery (if by personal delivery).

[Order 75-14, § 296-350-35020, filed 4/14/75.]

**WAC 296-350-35025 Extension of abatement date(s)—Application—Contents.** (1) The application for an extension of an abatement date or dates shall include:

- (a) The name of the applicant employer;
- (b) The address of the workplace or workplaces to which the application applies;
- (c) Identification of the CITATION which includes the abatement date(s) for which an extension is sought;
- (d) Identification of the specific abatement date(s) for which an extension is sought;
- (e) A statement of the actions the employer has taken to attempt to comply with the subject abatement date(s);
- (f) An identification of those factors, beyond the control of the employer, which have prevented or will prevent the employer from complying with the subject abatement date(s);
- (g) The length(s) of time sought for the extension(s);
- (h) The means of protecting employees during time employer is coming into compliance.

[Order 75-14, § 296-350-35025, filed 4/14/75.]

**WAC 296-350-35030 Extension of abatement date(s)—Provisional determination.** Upon receipt of the application the assistant director shall make a provisional determination to extend the subject abatement date(s) or to deny the application. The assistant director may conduct whatever investigation he/she deems proper prior to making the determination. The determination shall be in effect unless a hearing is requested in accordance with the provisions of these rules.

(1989 Ed.)

[Statutory Authority: RCW 49.17.040, 49.17.050, 49.17.240, chapters 42.30 and 43.22 RCW. 80-17-014 (Order 80-20), § 296-350-35030, filed 11/13/80; Order 75-14, § 296-350-35030, filed 4/14/75.]

**WAC 296-350-35035 Extension of abatement date(s)—Notice of application—Notice of opportunity for hearing—Notice of provisional determination.** (1) Following the making of the provisional determination according to WAC 296-350-35030 but no later than five working days after the receipt of the application the assistant director shall issue the following notices:

(a) A notice of receipt of the application, which shall include reference to the subject abatement dates;

(b) A notice of opportunity for a hearing on the application;

(c) A notice of provisional determination on the application.

(2) The assistant director may combine the notices required by the section on one document.

(3) The notices required by this section shall be signed by the assistant director, shall include the date of issuance by the assistant director and shall include the address to which requests for a hearing, if any, shall be sent.

[Statutory Authority: RCW 49.17.040, 49.17.050, 49.17.240, chapters 42.30 and 43.22 RCW. 80-17-014 (Order 80-20), § 296-350-35035, filed 11/13/80; Order 75-14, § 296-350-35035, filed 4/14/75.]

**WAC 296-350-35040 Extension of abatement date(s)—Posting.** (1) Immediately upon receipt, the notices issued in accordance with WAC 296-350-35035 shall be posted with the CITATION or CITATIONS which include the abatement date(s) for which an extension(s) is sought.

(2) The notices issued in accordance with WAC 296-350-35035 shall remain posted until the provisional abatement date(s) identified on the notice, or if a hearing is requested pursuant to WAC 296-350-35045, until a notice for hearing on the application for extension is posted.

[Order 75-14, § 296-350-35040, filed 4/14/75.]

**WAC 296-350-35045 Extension of abatement date(s)—Application for hearing.** (1) A hearing on the application for extension of abatement(s) may be applied for by the employer, an affected employee or employees of the employer or an authorized representative of such affected employees.

(2) Applications for hearings on application for extension of abatement date(s) shall be made to the assistant director at the address identified on the notice(s) issued pursuant to WAC 296-350-35035.

(3) Applications for hearings shall be served on the assistant director, according to the provisions of WAC 296-350-35020, at the address identified in the applicable notice not later than ten calendar days following the issuance of the notice.

[Statutory Authority: RCW 49.17.040, 49.17.050, 49.17.240, chapters 42.30 and 43.22 RCW. 80-17-014 (Order 80-20), § 296-350-35045, filed 11/13/80; Order 75-14, § 296-350-35045, filed 4/14/75.]

[Title 296 WAC—p 2251]

**WAC 296-350-35050 Extension of abatement date(s)—Notice of hearing.** (1) Upon receipt of a request for a hearing filed in accordance with WAC 296-350-35045 the assistant director shall issue a notice of hearing to the applicant and the employer stating that the opportunity will be afforded to all interested parties to participate in a hearing on the application for an extension of abatement date(s).

(2) The NOTICE OF HEARING shall fix the time and date for such hearing such that the parties can reasonably be expected to receive the NOTICE OF HEARING not less than twenty days in advance of the date set for the hearing.

(3) The NOTICE OF HEARING shall state the time, place, and nature of the proceeding; the legal authority and jurisdiction under which the hearing is to be held; a reference to the particular sections of the statute and the rules involved; and a short and plain statement of the matters asserted.

(4) The NOTICE OF HEARING, or a complete copy thereof, shall be posted by the employer with the CITATION containing the abatement date(s) for which an extension is sought and the notice(s) issued in accordance with WAC 296-350-35035, and shall remain posted until the date and time set for the hearing.

[Statutory Authority: RCW 49.17.040, 49.17.050, 49.17.240, chapters 42.30 and 43.22 RCW. 80-17-014 (Order 80-20), § 296-350-35050, filed 11/13/80; Order 75-14, § 296-350-35050, filed 4/14/75.]

**WAC 296-350-35055 Extension of abatement date(s)—Hearings.** (1) The assistant director shall designate personnel of the staff of the division of industrial safety and health to act as hearing officers at hearings on applications for extension of abatement date(s).

(2) A hearing officer shall be present and preside over the proceedings at all hearings conducted. The hearing officer may be accompanied by an assistant attorney general who shall be able to render legal advice to the hearing officer. The assistant attorney general may, at the hearing officer's request, preside over the proceedings.

(3) Prior to the commencement of the hearing, the hearing officer may confer with the parties attending the hearing concerning the material to be presented for the record in order to determine an orderly method of procedure.

(4) The provisions of chapter 34.04 RCW are applicable to hearings conducted pursuant to the provisions of this section.

(5) All proceedings relating to a hearing under this section shall be recorded mechanically or otherwise. Copies of transcripts of such recordings will be made available to any parties involved, upon request therefore and payment of the reasonable costs thereof.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 82-13-045 (Order 82-22), § 296-350-35055, filed 6/11/82. Statutory Authority: RCW 49.17.040, 49.17.050, 49.17.240, chapters 42.30 and 43.22 RCW. 80-17-014 (Order 80-20), § 296-350-35055, filed 11/13/80; Order 75-14, § 296-350-35055, filed 4/14/75.]

**WAC 296-350-35060 Extension of abatement date(s)—Decision and order.** (1) Following the conclusion of a hearing conducted pursuant to the provisions of this section, the assistant director shall issue an order affirming or modifying the abatement date(s) which is the subject of the application for extension of abatement date(s). Such order shall be in conformance with the provisions of chapter 34.04 RCW and chapter 296-08 WAC relating to practice and procedure in contested cases, as now or hereafter amended.

(2) A complete and unedited copy of the order issued pursuant to subsection (6) of this section shall be posted, immediately upon receipt, with the CITATION or CITATIONS which include the abatement date(s) to which the order applies.

[Statutory Authority: RCW 49.17.040, 49.17.050, 49.17.240, chapters 42.30 and 43.22 RCW. 80-17-014 (Order 80-20), § 296-350-35060, filed 11/13/80; Order 75-14, § 296-350-35060, filed 4/14/75.]

**WAC 296-350-400 Posting of notices—Posting of citation and notice—Availability of act and applicable standards.** (1) Definitions. The definitions of WAC 296-350-010 and 296-27-020 shall apply to this section.

(2) Each employer shall post and keep posted a notice or notices (the WISHA Poster, WISHERS No. 1) to be furnished by the division of industrial safety and health, department of labor and industries, informing employees of the protections and obligations provided for in the act and that for assistance and information, including copies of the act, and of specific safety and health standards employees should contact the employer or the nearest office of the department of labor and industries. Such notice or notices shall be posted by the employer at each establishment in a conspicuous place or places where notices to employees are customarily posted. Each employer shall take steps to assure that such notices are not altered, defaced or covered by other material.

(3) The notice identified in subsection (2) of this section shall be posted in each establishment of the employer as defined in WAC 296-27-020(7).

(4) All notices required to be posted by provisions of the act, provisions of this chapter or the provisions of any other safety and health standard, rule or regulation adopted pursuant to the authority of the act, shall be posted as required by this section, or as required by the act, or as required by the provision of the applicable safety and health standard, rule or regulation.

(5) Unless otherwise specified in this section, the act, or the applicable safety and health standard, rule or regulation, notices or other materials required to be posted, shall be posted in each establishment of the employer, as defined in WAC 296-27-020(7).

(6) Copies of the act, all regulations published in this chapter and all applicable standards shall be available at all regional offices of the division of industrial safety and health, department of labor and industries. If an employer has obtained copies of these materials, he shall make them available upon request to any employee or his authorized representative on the same day the request is made, or at the earliest time mutually convenient to the employee or his authorized representative

and the employer, for review by the requesting employee or authorized representative.

(7) Any employer failing to comply with the provisions of this section shall be subject to citation and penalty in accordance with the provisions of section 12 and 18 of the act. (RCW 49.17.120 and 49.17.180.)

(8) Documents required to be posted include, but shall not be limited to the following:

(a) A copy or copies of an application or applications for a variance or variances from any safety and health standards applied for in accordance with RCW 49.17.080 or 49.17.090 shall be posted at each establishment to which the variance, if granted, will apply. The manner of posting such applications shall be in accordance with subsections (4) and (5) of this section.

(b) Upon receipt of any CITATION AND NOTICE issued by the department pursuant to RCW 49.17.120 or 49.17.130, the employer shall immediately post the CITATION AND NOTICE or a copy thereof in a prominent place at or near each place a violation referred to in the CITATION AND NOTICE occurred. Where, because of the nature of the employer's operations, it is not practicable to post the CITATION AND NOTICE or a copy thereof at or near each place of violation, the CITATION AND NOTICE or a copy thereof shall be posted in the establishment of the employer, as defined in WAC 296-27-020(7).

The posted CITATION AND NOTICE or copy thereof shall be complete and shall not be abstracted, edited or otherwise changed from the original. The posted CITATION AND NOTICE or copy thereof shall be readily visible, and shall not be defaced or covered by other material.

The CITATION AND NOTICE or copy thereof shall remain posted as required by this subsection until all violations have been abated, or for three working days, whichever is longer. Whenever an employer verifies abatement of a violation in writing, see WAC 296-27-16009, a copy of the written verification shall be posted with the CITATION AND NOTICE for at least three working days.

(c) A copy of the notice of filing of appeal pursuant to RCW 49.17.140, the notice of conference pursuant to WAC 263-12-090, and the notice of hearing pursuant to WAC 263-12-100 shall be posted by the employer at each establishment to which the notices apply in a conspicuous place or places where notices to employees are customarily posted. The manner of posting such notices shall be in accordance with subsections (4) and (5) of this section.

(d) In the event that a proposed agreement settling an appeal of a citation and notice to the board of industrial insurance appeals is reached between the employer and the department without the concurrence of the affected employees or employee groups, a copy of the proposed agreement shall be posted by the employer at each establishment to which the agreement applies in a conspicuous place or places where notices to employees are customarily posted. The agreement shall be posted for 10 days before it is filed with the board of industrial insurance appeals. The manner of posting shall be in accordance with subsections (4) and (5) of this section.

(e) Notices required to be posted by specific provisions of any safety and health standard or other rule or regulation duly adopted by the director shall be posted according to the standard, rule or regulation requiring such posting. If the provision containing the requirement for posting does not specify the manner of posting, such posting shall conform to the requirements of subsections (4) and (5) of this section.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-064 (Order 86-02), § 296-350-400, filed 1/17/86; 82-13-045 (Order 82-22), § 296-350-400, filed 6/11/82; Order 75-14, § 296-350-400, filed 4/14/75. Formerly WAC 296-27-200.]

**WAC 296-350-450 Complaints by employees or their representatives.** (1) Any employee or representative of employees who in good faith believes that a violation of any safety or health standard or an imminent danger exists in any workplace where such employee is employed may request an inspection of such workplace by giving notice of the alleged violation or danger to any office or officer of the division of industrial safety and health of the department. Any such notice shall be reduced to writing, shall set forth with reasonable particularity the grounds for the notice, and shall be signed by the employee or representative of employees. A copy shall be provided the employer or his agent by an officer of the division no later than at the time of inspection, if any, except that upon the request of the person giving such notice, his name and the names of individual employees referred to therein shall not appear in such copy or on any record published, released, or made available by the department of labor and industries.

(2) If upon receipt of such notification it is determined that the complaint meets the requirements set forth in subsection (1) of this section, and that there are reasonable grounds to believe that the alleged violation or danger exists, an inspection shall be made as soon as practicable, to determine if such alleged violation or danger exists. Inspections under this section may extend beyond the matters referred to in the complaint.

(3) Prior to or during any inspection of a workplace, any employee or representative of employees employed in such workplace may notify the inspector, in writing, of any violation of the act or safety or health standard he has reason to believe exists in such workplace. Any such notice shall comply with the requirements of subsection (1) of this section.

(4) RCW 49.17.160(1) provides: "No person shall discharge or in any manner discriminate against any employee because such employee has filed any complaint or instituted or caused to be instituted any proceeding under or related to this chapter or has testified or is about to testify in such proceeding or because of the exercise of such employee on behalf of himself or others of any right afforded by this chapter."

[Order 75-14, § 296-350-450, filed 4/14/75.]

**WAC 296-350-460 Complaints--Inspection not warranted--Informal review.** (1) If it is determined that

an inspection is not warranted because there are no reasonable grounds to believe that a violation or danger exists with respect to a complaint received pursuant to WAC 296-350-450, the complaining party shall be notified in writing of such determination. The complaining party may obtain informal review of such determination by submitting a written statement of position with the assistant director of industrial safety and health requesting such review. Upon the request of the complaining party, the assistant director of industrial safety and health or his/her designee, at his/her discretion, may hold an informal conference in which the complaining party may present his/her views orally or in writing. After considering all written and oral views presented, the assistant director of industrial safety and health or his/her designee shall affirm, modify, or reverse the original determination and furnish the complaining party with written notification of his/her decision and the reasons therefor.

(2) If the assistant director of industrial safety and health or his/her designee, determines that an inspection is not warranted because the requirements of WAC 296-350-460(1) have not been met, he/she shall notify the complaining party in writing of such determination. Such determination shall be without prejudice to the filing of a new complaint meeting the requirements of WAC 296-350-460(1).

[Statutory Authority: RCW 49.17.040, 49.17.050, 49.17.240, chapters 42.30 and 43.22 RCW. 80-17-014 (Order 80-20, § 296-350-460, filed 11/13/80; Order 75-41, § 296-350-460, filed 12/19/75; Order 75-14, § 296-350-460, filed 4/14/75.)]

**WAC 296-350-470 Citation not issued following complaint.** (1) If a citation or notice of de minimis violations is issued for a violation alleged in a request for inspection under WAC 296-350-450(3), a copy of the citation or notice of de minimis violations shall also be sent to the employee or representative of employees who gave such notification.

(2) After an inspection, if it is determined that a citation is not warranted with respect to a danger or violation alleged to exist in a request for inspection under WAC 296-350-360(1), or a notification of violation under WAC 296-350-450(3), the informal review procedures prescribed in WAC 296-350-460(1) shall be applicable. After considering all views presented, the assistant director of industrial safety and health, or his/her designee, shall affirm the determination, order a reinspection, or issue a citation if he/she believes that the inspection disclosed a violation.

(3) The assistant director of industrial safety and health or his/her designee shall furnish the complaining party and the employer with written notification of his/her determination and the reasons therefor.

[Statutory Authority: RCW 49.17.040, 49.17.050, 49.17.240, chapters 42.30 and 43.22 RCW. 80-17-014 (Order 80-20), § 296-350-470, filed 11/13/80; Order 75-14, § 296-350-470, filed 4/14/75.]

**WAC 296-350-500 Citation and notice--Copy to employee representative.** (1) RCW 49.17.120 provides in pertinent part

"The director shall provide by rule for procedures to be followed by an employee representative upon written application to receive copies of CITATIONS AND NOTICES issued to any employer having employees who are represented by such employee representative. Such rule may prescribe the forms of such application, the time for renewal of applications, and the eligibility of the applicant to receive copies of CITATIONS AND NOTICES."

(2) "Employee representative" means:

(a) Any officer of the recognized bargaining agent of employees, acting on behalf of the employees of the employer.

(b) Any employee representative of an employer-employee safety committee within an establishment or the firm of the employer.

(c) Any employee of an employer who has been selected by the employees of that employer to act as their representative for the purposes indicated in subsection (1) of this section. Such selection shall be evidenced by a letter or other written communication to the division of industrial safety and health stating the name of the employee so selected and signed by not less than one-half of the employees of the employer so represented.

(3) An employee representative may receive copies of CITATIONS AND NOTICES issued to any employer having employees who are represented by such employee representative upon the filing of a complete application Form F418-023-000, a facsimile of which constitutes Appendix A of this section, with the division of industrial safety and health, Department of Labor and Industries, Olympia, Washington 98504.

(4) In the event that the director or his/her authorized representative finds that application for copies of the CITATION AND NOTICE have been received by more than one employee representative of the same employees of the employer, the director or his/her authorized representative may elect which of the applicants to which the copies of the CITATION AND NOTICE shall be sent.

(5) The director or his/her authorized representative may deny an application for copies of CITATIONS AND NOTICES upon finding that the applicant is not an employee representative as defined in subsection (2) of this section or upon finding that more than one employee representative of the same employees has applied for copies of CITATIONS AND NOTICES.

(6) An application for copies of CITATIONS AND NOTICES may be granted for a period not exceeding one year and may be renewed upon re-application for another one year period. The director or his/her authorized representative may, at the request of the applicant, waive the one year limitation.

(7) Upon the granting of the application for copies of CITATIONS AND NOTICES, the applicant shall be informed of the granting and of the date on which that grant shall expire.

[Statutory Authority: Chapter 49.17 RCW. 87-24-051 (Order 87-24), § 296-350-500, filed 11/30/87. Statutory Authority: RCW 49-17.040, 49.17.050, 49.17.240, chapters 42.30 and 43.22 RCW. 80-17-014 (Order 80-20), § 296-350-500, filed 11/13/80; Order 75-14, § 296-350-500, filed 4/14/75.]

WAC 296-350-990 Appendix A--Form F418-023-000--Application for copies of citations and notices.

APPENDIX A

DEPT. OF LABOR & INDUSTRIES  
Div. of Industrial Safety & Health  
P.O. Box 207  
Olympia, WA 98504

APPLICATION FOR COPIES OF CITATION AND NOTICES  
ISSUED PURSUANT TO THE WASHINGTON INDUSTRIAL SAFETY AND HEALTH ACT

Any employee of an employer who has been selected by the employees of that employer to act as their representative as defined in WAC 296-350-500 may apply for copies of CITATION AND NOTICES issued to said employer.

DEFINITION:

WAC 296-350-500(2) - "Employee representative" means:

- (a) Any officer of the recognized bargaining unit of employees, acting on behalf of the employees of the employer.
- (b) Any employee representative of an employer-employee safety committee within an establishment of the firm of the employer.
- (c) Any employee of an employer who has been selected by the employees of that employer to act as their representative for the purposes indicated in subsection (1) of this section. Such selection shall be evidenced by a letter or other written communication to the Division of Industrial Safety and Health stating the name of the employee so selected and signed by not less than one-half of the employees of the employer.

Applicant certifies he/she is an employee representative by virtue of WAC 296-350-500(2)

CERTIFICATION: I HEREBY CERTIFY UNDER PENALTY OF PERJURY THAT THE ABOVE STATEMENT IS TRUE TO THE BEST OF MY KNOWLEDGE.

Signature	position	date
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Name and address of applicant to which copies of CITATION AND NOTICES should be sent:

Name, address and Labor & Industries account I.D. and/or Unified Business Identifier of EMPLOYER HAVING EMPLOYEES WHO ARE REPRESENTED by the applicant (please give full information for each employer you represent - use extra paper if required):

The director or his/her authorized representative may deny this application if more than one employee representative has applied or if the applicant does not qualify as an employee representative.

For Department Use Only		
Application Rcvd. _____	Application Granted by _____	Date Application Granted _____
Applicant Notified _____	Expiration Date _____	
Comment:		

F418-023-000 app for copies of citation and notice 4-87 (Wish 300)

[Statutory Authority: Chapter 49.17 RCW. 87-24-051 (Order 87-24), § 296-350-990, filed 11/30/87. Statutory Authority: RCW 49.17.040, 49.17.050, 49.17.240, chapters 42.30 and 43.22 RCW. 80-17-014 (Order 80-20), § 296-350-990, filed 11/13/80; Order 75-14, Appendix A--Form 300 (codified as WAC 296-350-990), filed 4/14/75.]



## Chapter 296-360 WAC

## DISCRIMINATION, PURSUANT TO RCW 49.17.160

## WAC

296-360-005	Definitions.
296-360-010	Introduction.
296-360-020	General requirements of RCW 49.17.160 of WISHA.
296-360-030	Filing a complaint of discrimination.
296-360-040	Notification of assistant director's determination.
296-360-050	Withdrawal of complaint.
296-360-060	Arbitration or other agency proceedings.
296-360-070	Persons prohibited from discriminating.
296-360-080	Persons protected by RCW 49.17.160.
296-360-090	Unprotected activities distinguished.
296-360-100	Discrimination because of a complaint under or related to WISHA.
296-360-110	Discrimination because of a proceeding under or related to the act.
296-360-120	Discrimination because of testimony.
296-360-130	Discrimination because of exercise of any right afforded by WISHA—In general.
296-360-140	Discrimination because of exercise of right afforded by WISHA—Walkaround pay.
296-360-150	Discrimination because of exercise of right afforded by WISHA—Refusal to work in an unsafe condition.
296-360-160	Payment of damages to employee discriminated against.
296-360-170	Employee's refusal to comply with safety rules.

**WAC 296-360-005 Definitions.** For the purposes of this chapter.

(1) "Assistant director" – the assistant director for the division of industrial safety and health.

(2) "Division" – the division of industrial safety and health of the department of labor and industries.

[Statutory Authority: RCW 49.17.040, 49.17.050, 49.17.240, chapters 43.22 and 42.30 RCW. 80-17-015 (Order 80-21), § 296-360-005, filed 11/13/80.]

**WAC 296-360-010 Introduction.** (1) Chapter 49.17 RCW, the Washington Industrial Safety and Health Act (WISHA), is designed to regulate employment conditions affecting industrial safety and health and to achieve safer and healthier work places throughout the state. WISHA requires every person who has employees to furnish each of his or her employees employment and a place of employment free from recognized hazards that are causing or likely to cause death or serious physical harm, and to comply with industrial safety and health standards promulgated under WISHA.

(2) Employees and representatives of employees are afforded a wide range of substantive and procedural rights under WISHA. Effective implementation of WISHA and achievement of its goals depend in large part upon the active but orderly participation of employees, individually and through their representatives.

(3) This chapter deals essentially with the rights of employees afforded under RCW 49.17.160. RCW 49.17.160 prohibits reprisals, in any form, against employees who exercise rights under WISHA. The purpose of this chapter is to make available in one place interpretations of the various provisions of section 16 of WISHA that will guide the assistant director in the performance of his or her duties thereunder.

[Statutory Authority: RCW 49.17.040, 49.17.050, 49.17.240, chapters 43.22 and 42.30 RCW. 80-17-015 (Order 80-21), § 296-360-010, filed 11/13/80.]

**WAC 296-360-020 General requirements of RCW 49.17.160 of WISHA.** RCW 49.17.160 provides that no person shall discharge or in any manner discriminate against any employee because the employee has filed any complaint under or related to WISHA, instituted or caused to be instituted any proceeding under or related to WISHA, testified or is about to testify in any proceeding under or related to WISHA, or exercised on his or her own behalf or on behalf of others any right afforded by WISHA. Any employee who believes that he/she has been discriminated against in violation of section 16 of WISHA may, within thirty days after the violation occurs, file a complaint with the assistant director alleging the violation. The division shall investigate the complaint and, if the assistant director determines that section 16 of WISHA has been violated, the division may bring a civil action against the violator in superior court. The suit may ask the court to restrain violations of RCW 49.17.160 and to grant other appropriate relief, including rehiring or reinstating the employee to his or her former position with back pay.

[Statutory Authority: RCW 49.17.040, 49.17.050, 49.17.240, chapters 43.22 and 42.30 RCW. 80-17-015 (Order 80-21), § 296-360-020, filed 11/13/80.]

**WAC 296-360-030 Filing a complaint of discrimination.** (1) Who may file. A complaint of RCW 49.17.160 discrimination may be filed by the employee himself, or by a representative authorized to do so on his or her behalf.

(2) Nature of filing. No particular form of complaint is required.

(3) Place of filing. The complaint should be filed with the division.

(4) Time for filing. RCW 49.17.160(3) provides that an employee who believes that he or she has been discriminated against in violation of RCW 49.17.160 "may, within thirty days after such violation occurs" file a complaint with the assistant director. A major purpose of the thirty-day period is to allow the assistant director to decline to entertain complaints that have become stale. Accordingly, the division will presume that complaints not filed within thirty days of an alleged violation are untimely. There may be circumstances, however, that justify tolling the thirty-day period on recognized equitable principles or because strongly extenuating circumstances exist, e.g., where the employer has concealed, or misled the employee regarding the grounds for, discharge or other adverse action. In the absence of circumstances justifying a tolling of the thirty-day period, the division shall not accept untimely complaints.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 82-13-045 (Order 82-22), § 296-360-030, filed 6/11/82. Statutory Authority: RCW 49.17.040, 49.17.050, 49.17.240, chapters 43.22 and 42.30 RCW. 80-17-015 (Order 80-21), § 296-360-030, filed 11/13/80.]

**WAC 296-360-040 Notification of assistant director's determination.** (1) RCW 49.17.160(3) provides that



the assistant director is to notify a complainant within ninety days of the complaint of his determination whether prohibited discrimination has occurred. This ninety-day provision is directory, not mandatory. Although every effort will be made to notify complainants of the assistant director's determination within ninety days, there may be instances when it is not possible to do so.

(2) If a complainant receives a determination from the assistant director that prohibited discrimination has not occurred, the complainant may file a written request for review by the director within fifteen working days of receipt of the determination. The request for review must set forth the basis for the request. The request shall be filed by mailing or delivering the request to the Director of Labor and Industries, General Administration Building, Olympia, Washington 98504. Upon review the director may set aside the assistant director's determination, remand the matter for further investigation, or affirm the determination of the assistant director. The director shall notify the complainant of the decision after review.

[Statutory Authority: RCW 49.17.040 and 49.17.050, 85-10-004 (Order 85-09), § 296-360-040, filed 4/19/85. [Statutory Authority: RCW 49.17.040, 49.17.050, 49.17.240, chapters 43.22 and 42.30 RCW, 80-17-015 (Order 80-21), § 296-360-040, filed 11/13/80.]

**WAC 296-360-050 Withdrawal of complaint.** Enforcing the provisions of RCW 49.17.160 is not only a matter of protecting rights of individual employees, but also of protecting the public interest. Attempts by an employee to withdraw a filed complaint will not necessarily result in termination of the division's investigation. The division's jurisdiction cannot be foreclosed as a matter of law by unilateral action of the employee. However, a voluntary and uncoerced request from a complainant to withdraw his complaint shall generally be accepted.

[Statutory Authority: RCW 49.17.040, 49.17.050, 49.17.240, chapters 43.22 and 42.30 RCW, 80-17-015 (Order 80-21), § 296-360-050, filed 11/13/80.]

**WAC 296-360-060 Arbitration or other agency proceedings.** (1) General.

(a) An employee who files a complaint under RCW 49.17.160 may pursue remedies under grievance arbitration proceedings in collective bargaining agreements, and may also resort to other agencies, such as the National Labor Relations Board, for relief. The division's jurisdiction to entertain RCW 49.17.160 complaints, to investigate, and to determine whether discrimination has occurred, is independent of the jurisdiction of other agencies or bodies. The division may file an action in superior court regardless of the pendency of other proceedings.

(b) Where it is possible, however, the division favors voluntary resolution of disputes under procedures in collective bargaining agreements. Also, the division should defer to the jurisdiction of other forums established to resolve disputes that may also be related to RCW 49.17.160 complaints. Thus, where a complainant is pursuing remedies other than those provided by RCW

49.17.160 it may be proper to postpone the assistant director's determination whether discrimination has occurred, and defer to the results of such proceedings.

(2) Postponement of determination. Postponement of determination is justified where the rights asserted in other proceedings are substantially the same as rights under RCW 49.17.160 and those proceedings are not likely to violate the rights guaranteed by RCW 49.17.160. The factual issues in the such proceedings must be substantially the same as those raised by the RCW 49.17.160 complaint, and the forum hearing the matter must have the power to determine the ultimate issue of discrimination.

(3) Deferral to outcome of other proceedings. Determinations to defer to the outcome of another proceeding begun by a complainant must be made after careful scrutiny. It must be clear that the proceeding dealt adequately with all factual issues, that it was fair, regular, and free of procedural infirmities, and that its outcome did not violate the purpose and policy of WISHA. If another action begun by a complainant is dismissed without an adjudicatory hearing on the merits, the division will not necessarily regard the dismissal as determinative of the merits of the RCW 49.17.160 complaint.

[Statutory Authority: RCW 49.17.040, 49.17.050, 49.17.240, chapters 43.22 and 42.30 RCW, 80-17-015 (Order 80-21), § 296-360-060, filed 11/13/80.]

**WAC 296-360-070 Persons prohibited from discriminating.** RCW 49.17.160 specifically states that "no person shall discharge or in any manner discriminate against any employee" because the employee has exercised rights under WISHA. RCW 49.17.020(5), defines "person" as "one or more individuals, partnerships, associations, corporations, business trusts, legal representatives, or any organized group of persons." Consequently, the prohibitions of RCW 49.17.160 are not limited to actions taken by employers against their own employees. A person may be charged with discriminating against an employee of another person. RCW 49.17.160 extends to such entities as organizations representing employees in collective bargaining, employment agencies, or any other person in a position to discriminate against an employee. See *Meek v. United States*, 136 F.2d 679 (6th Cir., 1943); *Bowe v. Judson C. Burns*, 137 F.2d 37 (3rd Cir., 1943).

[Statutory Authority: RCW 49.17.040, 49.17.050, 49.17.240, chapters 43.22 and 42.30 RCW, 80-17-015 (Order 80-21), § 296-360-070, filed 11/13/80.]

**WAC 296-360-080 Persons protected by RCW 49.17.160.** (1) All employees are afforded the full protection of RCW 49.17.160. WISHA defines an employee as "an employee of an employer who is employed in a business of his employer which affects commerce." RCW 49.17.020(4). WISHA does not define "employ"; however, the broad remedial nature of WISHA demonstrates a clear intent that the existence of an employment relationship, for purposes of RCW 49.17.160, is to be based upon economic realities rather than upon common law doctrines and concepts. See *U.S. v. Silk*, 331

U.S. 704 (1947); Rutherford Food Corporation v. McComb, 331 U.S. 722 (1947).

(2) For purposes of RCW 49.17.160, an applicant for employment could be considered an employee. See NLRB v. Lamar Creamery, 246 F.2d 8 (5th Cir., 1957).

[Statutory Authority: RCW 49.17.040, 49.17.050, 49.17.240, chapters 43.22 and 42.30 RCW. 80-17-015 (Order 80-21), § 296-360-080, filed 11/13/80.]

**WAC 296-360-090 Unprotected activities distinguished.** (1) An employer or others may base actions that adversely affect an employee upon nondiscriminatory grounds. An employee's engagement in activities protected by WISHA does not automatically render him immune from discharge or discipline for legitimate reasons, or from adverse action dictated by nonprohibited considerations. See NLRB v. Dixie Motor Coach Corp. 128 F.2d 201 (5th Cir., 1942).

(2) To establish a violation of RCW 49.17.160, the employee's engagement in protected activity need not be the sole consideration behind discharge or other adverse action. If protected activity was a substantial reason for the action, or if the discharge or other adverse action would not have taken place "but for" the employee's engagement in protected activity, RCW 49.17.160 has been violated.

[Statutory Authority: RCW 49.17.040, 49.17.050, 49.17.240, chapters 43.22 and 42.30 RCW. 80-17-015 (Order 80-21), § 296-360-090, filed 11/13/80.]

**WAC 296-360-100 Discrimination because of a complaint under or related to WISHA.** RCW 49.17.160 prohibits discharge of, or discrimination against, an employee because the employee has filed any complaint under or related to this act.

(1) An example of a complaint made "under" WISHA would be an employee request for inspection pursuant to section 11 (RCW 49.17.110). This is not the only type of complaint protected by RCW 49.17.160, however. The range of complaints "related to" WISHA is commensurate with the broad remedial purposes of this legislation and the sweeping scope of its application.

(2) Complaints registered with other state or federal agencies that have the authority to regulate or investigate industrial safety and health conditions are complaints "related to" WISHA.

(3) The protection offered employees by WISHA would be seriously undermined if employees were discouraged from lodging complaints about industrial safety and health matters with their employers. Complaints to employers, if made in good faith, are related to WISHA, and an employee is protected against discharge or discrimination caused by a complaint to the employer.

(4) To come within the protection of RCW 49.17.160, a complaint must relate to conditions at the work place, as distinguished from complaints touching only upon general public safety and health.

[Statutory Authority: RCW 49.17.040, 49.17.050, 49.17.240, chapters 43.22 and 42.30 RCW. 80-17-015 (Order 80-21), § 296-360-100, filed 11/13/80.]

**WAC 296-360-110 Discrimination because of a proceeding under or related to the act.** (1) RCW 49.17.160 prohibits discharge of, or discrimination against, any employee because the employee has "instituted or caused to be instituted any proceeding under or related to WISHA." Proceedings that can arise specifically under WISHA include inspections of worksites under RCW 49.17.070, employee contest of an abatement date under RCW 49.17.140, employee initiation of proceedings for promulgation of an industrial safety and health standard, employee application for modification or revocation of a variance under RCW 49.17.080, employee judicial challenge of a standard, and employee appeal of board of industrial insurance appeals order under RCW 49.17.140. In determining whether a "proceeding" is "related to" WISHA, the considerations discussed in WAC 296-360-100 are also applicable.

(2) An employee need not directly institute a proceeding. It is sufficient if he or she sets into motion acts of others that result in proceedings under or related to WISHA.

[Statutory Authority: RCW 49.17.040, 49.17.050, 49.17.240, chapters 43.22 and 42.30 RCW. 80-17-015 (Order 80-21), § 296-360-110, filed 11/13/80.]

**WAC 296-360-120 Discrimination because of testimony.** RCW 49.17.160 prohibits discharge of, or discrimination against, any employee because the employee "has testified or is about to testify" in proceedings under or related to WISHA. This protection is not limited to testimony in proceedings instituted or caused to be instituted by the employee, but extends to any statements given in the course of judicial, quasijudicial, and administrative proceedings, including inspections, investigations, administrative adjudications, and rules hearings.

[Statutory Authority: RCW 49.17.040, 49.17.050, 49.17.240, chapters 43.22 and 42.30 RCW. 80-17-015 (Order 80-21), § 296-360-120, filed 11/13/80.]

**WAC 296-360-130 Discrimination because of exercise of any right afforded by WISHA--In general.** In addition to protecting employees who file complaints, institute proceedings, or testify in proceedings under or related to WISHA, RCW 49.17.160 also protects employees from discrimination occurring because of the exercise "of any right afforded by this chapter." Certain rights are explicitly stated in WISHA. Other rights exist by necessary implication. For example, employees may request information from the occupational safety and health administration or the department of labor and industries. Also, employees interviewed by agents of the division in the course of inspections or investigations cannot subsequently be discriminated against because of their cooperation.

[Statutory Authority: RCW 49.17.040, 49.17.050, 49.17.240, chapters 43.22 and 42.30 RCW. 80-17-015 (Order 80-21), § 296-360-130, filed 11/13/80.]

**WAC 296-360-140 Discrimination because of exercise of right afforded by WISHA--Walkaround pay.** Employee participation in walkaround inspections under RCW 49.17.100 is essential. Employees are a vital

source of information to the safety division about work place hazards. Employees must be able freely to exercise their statutory right to participate in walkarounds without fear of economic loss, such as the denial of pay for the time spent helping WISHA inspectors during the walkaround. To ensure the unimpeded flow of information to the inspectors, and the unfettered statutory right of employees to participate in walkaround inspections, an employer's failure to pay employees for time they spend in walkaround inspections is discrimination under RCW 49.17.160. In addition, an employer's failure to pay employees for time spent in other inspection-related activities, such as answering questions of inspectors or participating in the opening and closing conferences, is discrimination under RCW 49.17.160.

[Statutory Authority: RCW 49.17.040, 49.17.050, 49.17.240, chapters 43.22 and 42.30 RCW. 80-17-015 (Order 80-21), § 296-360-140, filed 11/13/80.]

**WAC 296-360-150 Discrimination because of exercise of right afforded by WISHA--Refusal to work in an unsafe condition.** (1) Review of WISHA and examination of the legislative history discloses that, as a general matter, WISHA grants no specific right to employees to walk off the job because of potential unsafe conditions at the work place. A hazardous condition that may violate WISHA will ordinarily be corrected by the employer, once brought to its attention. If the employer does not correct a hazard, or if there is a dispute about the existence of a hazard, the employee normally can ask the division to inspect the work place pursuant to RCW 49.17.110, or can seek help from other public agencies that have responsibility for safety and health. Under such circumstances, an employer would not violate RCW 49.17.160 by disciplining an employee who refuses to work because of an alleged safety or health hazard.

(2) Occasions arise, however, when an employee is confronted with a choice between not performing assigned tasks or subjecting him- or herself to serious injury or death arising from a hazard at the work place. If the employee, with no reasonable alternative, refuses in good faith to expose him- or herself to the dangerous condition, he or she is protected against subsequent discrimination.

(3) An employee's refusal to work is protected if he or she meets the following requirements:

(a) The refusal to work must be in good faith, and must not be a disguised attempt to harass the employer or disrupt the employer's business;

(b) The hazard causing the employee's apprehension of death or injury must be such that a reasonable person, under the circumstances then confronting the employee, would conclude that there is a real danger of death or serious injury; and

(c) There must be insufficient time, due to the urgency of the situation, to eliminate the danger through resort to regular statutory enforcement channels.

(4) As indicated in subsection (3), an employee's refusal to work is not protected unless it is a good faith response to a hazardous condition. To determine whether an employee has acted in good faith, the division will consider, among other factors, whether the employee:

(a) Asked the employer to correct the hazard;

(b) Asked for other work;

(c) Remained on the job until ordered to leave by the employer; or

(d) Informed the employer that, if the hazard was not corrected, the employee would refuse to work.

The lack of one or more of these factors shall not necessarily preclude a finding of good faith if other factors do establish good faith. The division will also consider whether the employer knew that the hazard could cause serious injury or death, or that the hazard was prescribed by a specific safety standard promulgated under WISHA or any other law that relates to the safety and health of a place of employment.

[Statutory Authority: RCW 49.17.040, 49.17.050, 49.17.240, chapters 43.22 and 42.30 RCW. 80-17-015 (Order 80-21), § 296-360-150, filed 11/13/80.]

**WAC 296-360-160 Payment of damages to employee discriminated against.** (1) If an employer discriminates against an employee such that the employee earns less than he or she would have earned absent the discrimination, the employer shall pay the employee the difference between the wages that the employee would have earned absent the discrimination and the wages the employee actually earned after the discrimination.

(2) If an employer discriminates against an employee for a refusal to work that is protected under WAC 296-360-150, the employer need not pay the employee's wages for the time spent fixing the hazard, or that would have been spent fixing the hazard, if the employer (a) had to or would have had to shut down the job to make the repair and (b) had not other work the employee could have done.

[Statutory Authority: RCW 49.17.040, 49.17.050, 49.17.240, chapters 43.22 and 42.30 RCW. 80-17-015 (Order 80-21), § 296-360-160, filed 11/13/80.]

**WAC 296-360-170 Employee's refusal to comply with safety rules.** An employee who refuses to comply with industrial safety and health standards or valid safety rules implemented by the employer in furtherance of WISHA is not exercising a right afforded by WISHA. Discipline taken by employers solely in response to an employee's refusal to comply with appropriate safety rules and regulations is not discrimination prohibited by RCW 49.17.160. This situation should be distinguished from refusals to work discussed in WAC 296-360-150.

[Statutory Authority: RCW 49.17.040, 49.17.050, 49.17.240, chapters 43.22 and 42.30 RCW. 80-17-015 (Order 80-21), § 296-360-170, filed 11/13/80.]

**Chapter 296-400 WAC**  
**CERTIFICATION OF COMPETENCY FOR**  
**JOURNEYMAN PLUMBERS**

WAC	
296-400-005	Definitions.
296-400-020	Plumbers with license or practicing the plumbing trade at effective date of the act.
296-400-030	Issuing of temporary certificate.
296-400-035	Inactive status.
296-400-045	Plumber examination, certification, reinstatement, and temporary permit fees.
296-400-050	Meetings of governor's advisory board.
296-400-070	Reciprocity.
296-400-100	Computation of years of employment.
296-400-110	Previous experience credit.
296-400-120	Plumber trainee certificates.
296-400-130	Penalties for false statements or material misrepresentation.
296-400-140	Enforcement.
296-400-300	Procedures for notices of infraction.

**DISPOSITION OF SECTIONS FORMERLY CODIFIED IN THIS CHAPTER**

296-400-010	Examination fee and notification. [Order 73-20, § 296-400-010, filed 10/29/73.] Repealed by 83-19-044 (Order 83-26), filed 9/16/83. Statutory Authority: RCW 18.106.140 and 1983 c 124 § 10.
296-400-040	Requirements for an apprentice permit. [Order 74-13, § 296-400-040, filed 4/15/74; Order 73-20, § 296-400-040, filed 10/29/73.] Repealed by Order 75-27, filed 8/4/75.

**WAC 296-400-005 Definitions.** Unless a different meaning is plainly required by the context, the following words and phrases as used in this chapter shall have the following meaning:

- (1) "Advisory board" means the state advisory board of plumbers;
- (2) "Department" means the department of labor and industries;
- (3) "Director" means the director of department of labor and industries;
- (4) "Journeyman plumber" means any person who has been issued a certificate of competency by the department of labor and industries as provided in this chapter;
- (5) "Specialty plumber" means anyone who has been issued a specialty certificate of competency limited to installation, maintenance, and repair of the plumbing of single family dwellings, duplexes, and apartment buildings which do not exceed three stories;
- (6) "Plumbing" means that craft involved in installing, altering, repairing, and renovating potable water systems and liquid waste systems within a building: *Provided*, That installation in a water system of water softening or water treatment equipment shall not be within the meaning of plumbing as used in this chapter;
- (7) "Trainee plumber" means any person being trained in the plumbing construction industry under the direct supervision of a journeyman plumber or specialty plumber working in his or her specialty.

[Statutory Authority: Chapter 18.106 RCW. 86-19-083 (Order 86-30), § 296-400-005, filed 9/17/86.]

[Title 296 WAC—p 2260]

**WAC 296-400-020 Plumbers with license or practicing the plumbing trade at effective date of the act.** Any applicant who is qualified to apply for and receive a certificate of competency under RCW 18.106.080 of the Plumbers Licensing Act (chapter 175, Laws of 1973 1st ex. sess.) must make his application therefor no later than November 30, 1973. All applications received after November 30, 1973 must be accompanied by the evidence of competency and experience required in RCW 18.106.030 of the act and the applicant must take the examination provided for in RCW 18.106.040 of the act. An applicant to be certified as a journeyman plumber must have had four or more years of experience under the direct supervision of a licensed journeyman plumber.

[Order 76-2, § 296-400-020, filed 1/30/76; Order 73-20, § 296-400-020, filed 10/29/73.]

**WAC 296-400-030 Issuing of temporary certificate.** The department may issue to an applicant one out-of-state temporary certificate before the examination of the applicant for a period of ninety days or less.

The applicant shall surrender the temporary certificate to the person conducting the examination when the applicant appears for the examination. If the applicant with a temporary certificate does not appear for the examination the permit will expire on the expiration date specified on the permit.

[Statutory Authority: Chapter 18.106 RCW. 86-19-083 (Order 86-30), § 296-400-030, filed 9/17/86. Statutory Authority: RCW 18.106.140 and 1983 c 124 § 10. 83-19-044 (Order 83-26), § 296-400-030, filed 9/16/83; Order 74-13, § 296-400-030, filed 4/15/74; Order 73-20, § 296-400-030, filed 10/29/73.]

**WAC 296-400-035 Inactive status.** Persons requesting to be placed on inactive status shall be sixty-two years of age or older and shall not be employed in the trade of plumbing. They may request such status provided they are currently registered. They may return to active status upon payment of fee to the department without reexamination.

[Statutory Authority: Chapter 18.106 RCW. 86-19-083 (Order 86-30), § 296-400-035, filed 9/17/86.]

**WAC 296-400-045 Plumber examination, certification, reinstatement, and temporary permit fees.**

Examination fee:	\$100.00
Trainee certificate fee (1 year):	\$ 30.00
Issuance of trainee certificate for less than 1 year:	\$ 3.00 for each month of certificate period with a minimum fee of \$ 20.00

The trainee certificate shall expire one year from the date of issuance, and shall be renewed on or before the date of expiration.

Temporary permit fee:	\$ 50.00
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Issuance or renewal of journeyman or specialty certificate fee (2 year):	\$ 80.00
Issuance of certificate for less than two years:	\$ 3.50
	for each month of certificate period with a minimum fee of \$30.00
Reinstatement of journeyman or specialty certificate:	\$160.00
Replacement of all certificates:	\$ 30.00

Each person who has passed the examination for the plumbers certificate of competency and has paid the certificate fee shall be issued a certificate of competency that will expire on his or her birthdate. If the person was born in an even-numbered year, the certificate shall expire on the person's birthdate in the next even-numbered year. If the person was born in an odd-numbered year, the certificate shall expire on the person's birthdate in the next odd-numbered year.

[Statutory Authority: RCW 18.106.125, 89-12-004 (Order 89-04), § 296-400-045, filed 5/25/89; 88-06-037 (Order 87-32), § 296-400-045, filed 2/29/88. Statutory Authority: Chapter 18.106 RCW, 86-19-083 (Order 86-30), § 296-400-045, filed 9/17/86. Statutory Authority: RCW 18.106.140 and 1983 c 124 § 10, 83-19-044 (Order 83-26), § 296-400-045, filed 9/16/83.]

**WAC 296-400-050 Meetings of governor's advisory board.** The governor's advisory board meetings will be regularly scheduled quarterly starting the third Tuesday of January.

[Statutory Authority: Chapter 18.106 RCW, 86-19-083 (Order 86-30), § 296-400-050, filed 9/17/86; Order 73-20, § 296-400-050, filed 10/29/73.]

**WAC 296-400-070 Reciprocity.** Persons applying for a journeyman or specialty plumbers certificate of competency who permanently reside in a state signatory to a reciprocal agreement with the state of Washington shall have a valid certificate of competency from the state in which they permanently reside.

Such persons shall not make application to take the journeyman or specialty plumbers examination in the state of Washington in lieu of taking an examination in their home state.

[Statutory Authority: Chapter 18.106 RCW, 86-19-083 (Order 86-30), § 296-400-070, filed 9/17/86.]

**WAC 296-400-100 Computation of years of employment.** (1) For the purposes of RCW 18.106.070(2), one thousand five hundred hours of employment shall be considered one year of employment.

(2) At the time of renewal, the holder shall provide the department with an accurate list of the holder's employers in the plumbing industry for the previous year

and the number of hours worked for each employer on a form approved by and available from the department.

(3) A person who has completed a one, two, three, or four year trainee program in plumbing construction, shall be considered to have completed the necessary hours of training for the year in which they are registered.

[Statutory Authority: Chapter 18.106 RCW, 86-19-083 (Order 86-30), § 296-400-100, filed 9/17/86.]

**WAC 296-400-110 Previous experience credit.** A person who is applying for a plumber trainee certificate who has already worked in plumbing construction shall receive credit for all verifiable hours worked submitted on a form approved by and available from the department.

[Statutory Authority: Chapter 18.106 RCW, 86-19-083 (Order 86-30), § 296-400-110, filed 9/17/86.]

**WAC 296-400-120 Plumber trainee certificates.** (1) The department shall issue separate plumbing trainee certificates for the first, second, third, and fourth years of training. If a person has less than one thousand five hundred hours of employment as a plumber trainee in construction, the department shall give the individual a first year certificate; if more than one thousand four hundred ninety-nine but less than three thousand hours a second year certificate; if more than two thousand nine hundred ninety-nine but less than four thousand five hundred hours, a third year certificate; and if more than four thousand four hundred ninety-nine hours a fourth year certificate.

(2) A holder of a plumber trainee certificate may apply for the next year's certificate whenever he or she has sufficient documented hours of employment as a plumber trainee.

(3) A holder of a plumber trainee certificate may take the specialty plumber examination after completing four thousand five hundred hours of documented training and the journeyman examination after completing six thousand hours of documented training.

(4) A trainee making application for a journeyman certificate shall have completed a minimum of two years, of the required four years, as a trainee engaged in commercial plumbing.

(5) No person shall be issued a training certificate for more than eight years, except the department may consider extenuating circumstances.

(6) Journeyman plumber trainee. No trainee shall work without being under the direct supervision of a journeyman plumber, until such time as they have completed fifty-five hundred hours of training, and may continue to work without supervision until they achieve six thousand hours of training, at which time they shall be required to take the journeyman examination.

(7) A trainee who has failed the journeyman plumbers examination shall not be eligible to retake the examination for six months, and shall not be eligible to work without being under the direct supervision of a journeyman plumber until such time as they have passed the journeyman plumbers examination.

(8) Specialty plumber trainee. A specialty trainee shall have completed four thousand five hundred hours of training under the direct supervision of a certified specialty or journeyman plumber to be eligible to take the specialty plumbers examination. A trainee who has failed the examination may not be eligible to retake the examination for six months, and shall be required to work under the direct supervision of a certified plumber until such time as they have passed the specialty plumbers examination.

[Statutory Authority: Chapter 18.106 RCW. 86-19-083 (Order 86-30), § 296-400-120, filed 9/17/86.]

**WAC 296-400-130 Penalties for false statements or material misrepresentation.** (1) All applications required under chapter 18.106 RCW and the annual statement of hours of employment required under RCW 18.106.070(2) shall be made under oath. A person who knowingly makes a false statement or material misrepresentation on an application or statement or misrepresentation of trainee certificate may be referred to the county prosecutor for criminal prosecution under RCW 9A.72.020, 9A.72.030, and 9A.72.040. The department may also subtract up to one thousand eight hundred hours of employment from a trainee's acceptable total hours, if the department determines the trainee has made a false statement or material misrepresentation.

(2) Decisions of the department under this section are subject to appeal to the advisory board. The hearing shall be conducted in accordance with the provisions of chapter 34.04 RCW.

[Statutory Authority: Chapter 18.106 RCW. 86-19-083 (Order 86-30), § 296-400-130, filed 9/17/86.]

**WAC 296-400-140 Enforcement.** (1) The department shall ensure that persons subject to chapter 18.106 RCW comply with that chapter by inspecting the job sites. The inspections shall be made by the department's compliance inspectors.

(2) The compliance inspector shall determine whether:

(a) Each person doing plumbing work on the job site has a proper journeyman, specialty, or trainee certificate on their person;

(b) The ratio of the certified journeyman plumbers to the certified trainees on the job site is correct; and

(c) Each certified trainee is directly supervised by an individual with a journeyman or specialty certificate of competency.

(3) If the compliance inspector determines a person has violated chapter 18.106 RCW, the department shall issue a notice of infraction that describes the reason the person has violated chapter 18.106 RCW.

(4) A person wishing to appeal a notice of infraction shall do so by complying to the requirement of RCW 18.106.220.

[Statutory Authority: Chapter 18.106 RCW. 86-19-083 (Order 86-30), § 296-400-140, filed 9/17/86.]

**WAC 296-400-300 Procedures for notices of infraction.** (1) The department may issue a notice of infraction to a plumber that violates RCW 18.106.180.

The notice of infraction by law must be on the same basic form as that prescribed for traffic infractions. The supreme court has adopted the justice court traffic infraction rules (JTIR) as the rules of procedure for traffic infractions. To ensure that court procedures are the same for plumber notices of infraction as for traffic notices of infraction, the department shall comply with all JTIR rules except for rules 1.1, 1.2, 2.1, and 2.4(a). Rules 1.1, 1.2, and 2.1 do not directly apply to notices of violation for plumbers. Rule 2.4(a) does not apply because RCW 18.106.220 provides that a defendant must respond to a notice of violation within fourteen days, not within seven days as for a traffic infraction.

(2) In reading the JTIR rules, the following terms, as they appear in the rules, shall be construed to mean:

(a) "Department" means the department of labor and industries, not the department of licensing;

(b) "Notice of traffic infraction" means notice of infraction;

(c) "Traffic case" means a plumber infraction case;

(d) "Law enforcement officer" means a representative of the department.

[Statutory Authority: RCW 18.27.040, 18.27.200 and 18.106.020. 84-12-018 (Order 84-08), § 296-400-300, filed 5/25/84.]

### Chapter 296-401 WAC CERTIFICATION OF COMPETENCY FOR JOURNEYMAN ELECTRICIANS

#### WAC

296-401-020	Electricians with licenses or practicing the electrical trade at effective date of the act.
296-401-030	Issuing of temporary permits.
296-401-060	Specialty certificates.
296-401-080	Eligibility for journeyman examination.
296-401-085	Eligibility for specialty examination.
296-401-087	Partial credit for experience.
296-401-090	Status of person who has failed an examination for an electrician certificate of competency.
296-401-100	Computation of years of employment—Renewal of training certificates.
296-401-110	Previous experience credit.
296-401-120	Electrical training certificates.
296-401-150	Penalties for false statements or material misrepresentation.
296-401-160	Enforcement.
296-401-165	Issuing and renewing an electrician certificate of competency.
296-401-168	Reciprocal electrician certificates.
296-401-170	Hearing or appeal procedure.
296-401-175	Journeyman, specialty and trainee certificate, and examination fees.
296-401-180	Examination subjects for specialty and journeyman certificates of competency.

#### DISPOSITION OF SECTIONS FORMERLY CODIFIED IN THIS CHAPTER

296-401-010	Examination and fees. [Statutory Authority: RCW 19.28.060 and 19.28.210. 82-18-036 (Order 82-29), § 296-401-010, filed 8/26/82; Order 73-21, § 296-401-010, filed 11/5/73.] Repealed by 83-23-053 (Order 83-32), filed 11/14/83. Statutory Authority: RCW 19.28.120 and 19.28.510.
296-401-040	Requirements for an apprentice permit. [Order 74-12, § 296-401-040, filed 4/15/74; Order 73-21, 296-401-040, filed 11/5/73.] Repealed by Order 75-26, filed 8/4/75.



- 296-401-050 Meetings of governor's advisory board. [Order 73-21, § 296-401-050, filed 11/5/73.] Repealed by 81-06-037 (Order 81-5), filed 2/27/81, effective 4/1/81. Statutory Authority: RCW 19.28.060.
- 296-401-070 Eligibility for specialty examination. [Statutory Authority: RCW 18.37.130. 80-02-052 (Order 80-1), § 296-401-070, filed 1/16/80.] Repealed by 83-23-053 (Order 83-32), filed 11/14/83. Statutory Authority: RCW 19.28.120 and 19.28.510.
- 296-401-130 Annual renewal of electrical journeyman, specialty, and trainee certificates. [Statutory Authority: RCW 19.28.600. 83-12-021 (Order 83-14), § 296-401-130, filed 5/25/83. Statutory Authority: RCW 18.37.130. 80-02-052 (Order 80-1), § 296-401-130, filed 1/16/80.] Repealed by 83-23-053 (Order 83-32), filed 11/14/83. Statutory Authority: RCW 19.28.120 and 19.28.510.
- 296-401-140 Supervision of trainees in the electrical trades. [Statutory Authority: RCW 19.28.060. 81-06-037 (Order 81-5), § 296-401-140, filed 2/27/81, effective 4/1/81. Statutory Authority: RCW 18.37.130. 80-02-052 (Order 80-1), § 296-401-140, filed 1/16/80.] Repealed by 83-23-053 (Order 83-32), filed 11/14/83. Statutory Authority: RCW 19.28.120 and 19.28.510.

**WAC 296-401-020 Electricians with licenses or practicing the electrical trade at effective date of the act.** Any application for certification under RCW 19.28.560 of this act must be received by the department prior to December 14, 1973. As defined in RCW 19.28.530 an applicant to be certified as a journeyman electrician must have had four or more years of experience under the direct supervision of a licensed journeyman electrician.

[Statutory Authority: RCW 19.28.060. 81-06-037 (Order 81-5), § 296-401-020, filed 2/27/81, effective 4/1/81; Order 76-3, § 296-401-020, filed 1/30/76; Order 73-21, § 296-401-020, filed 11/5/73.]

**WAC 296-401-030 Issuing of temporary permits.** (1) The department will issue to an applicant who meets the eligibility requirements of RCW 19.28.530, one out-of-state temporary permit during the period of time between filing an application to take the next certification examination and the date the results of the examination are furnished to the applicant.

If the applicant with a temporary permit does not appear for the examination the applicant has been scheduled for, the permit will expire on the expiration date specified on the permit.

(2) The department will issue a second temporary certificate of competency to an applicant for a period of ninety days or less only if the applicant furnishes evidence to the department of enrollment in an electrician training or refresher course which has been approved by the electrical board.

[Statutory Authority: RCW 19.28.060. 88-16-002 (Order 88-15), § 296-401-030, filed 7/21/88. Statutory Authority: RCW 19.28.060, 19.28.600 and chapter 19.28 RCW. 86-18-041 (Order 86-23), § 296-401-030, filed 8/29/86. Statutory Authority: RCW 19.28.120 and 19.28.510. 83-23-053 (Order 83-32), § 296-401-030, filed 11/14/83; Order 74-12, § 296-401-030, filed 4/15/74; Order 73-21, § 296-401-030, filed 11/5/73.]

**WAC 296-401-060 Specialty certificates.** The department shall issue specialty electrician's certificates of competency in the following areas of electrical work:

(1) Residential (02). The holder of a residential certificate is limited to wiring one-family and two-family dwellings, or multifamily dwellings that do not exceed three floors above grade. All wiring shall be in nonmetallic sheathed cable, except service and feeder wiring. This specialty does not include wiring commercial occupancies such as motels, hotels, offices, or stores.

(2) Pump and irrigation (03). The holder is limited to the electrical connection of domestic and irrigation water pumps, circular irrigating systems, and related pumps and pump houses. The holder may also install the circuits, feeders, controls, and services necessary to supply electricity to the pumps.

(3) Signs (04). The holder is limited to; placing and connecting signs and outline lighting and their electrical supply, controls, and associated circuit extensions; and the installation of a maximum 60 ampere, 120/240 volt, single phase service to supply power to a remote sign only.

(4) Domestic appliances (05). The holder is limited to the electrical connection of domestic appliances and their wiring, such as hot water heaters, ranges, dishwashers, clothes dryers, oil and gas furnaces, and similar appliances. The holder may also install the circuits to domestic appliances but may not install service or feeder wires, or circuits to electric furnaces and heat pump equipment.

(5) Limited energy system (06). The holder is limited to installing signaling circuits, power limited circuits, and related equipment. Such equipment includes fire protection signaling systems, intrusion alarms, nonutility-owned communication systems, and similar low energy circuits and equipment.

(6) Nonresidential maintenance (07). The holder is limited to maintaining, repairing and replacing electrical equipment and conductors on industrial or commercial premises. This specialty certificate does not include maintenance activities in hotel, motel or dwelling units.

[Statutory Authority: RCW 19.28.060, 19.28.600 and chapter 19.28 RCW. 86-18-041 (Order 86-23), § 296-401-060, filed 8/29/86. Statutory Authority: RCW 19.28.120 and 19.28.510. 83-23-053 (Order 83-32), § 296-401-060, filed 11/14/83. Statutory Authority: RCW 18.37.130. 80-02-052 (Order 80-1), § 296-401-060, filed 1/16/80.]

**WAC 296-401-080 Eligibility for journeyman examination.** A person holding an electrical training certificate who has: (1) Been employed under the direct supervision of a journeyman electrician for four years, or (2) has completed a four year apprenticeship program in the electrical construction trade that is registered with the state apprenticeship council or the Federal Bureau of Apprenticeship and Training, or (3) is a graduate of a trade school program in the electrical construction trade that was established during 1946, shall be eligible to take the examination for a journeyman certificate of competency. A person who has had two years of schooling under the conditions provided in RCW 19.28.530 in addition to two years of employment under the direct supervision of a journeyman electrician shall be eligible to take the examination for a journeyman certificate of competency.



[Statutory Authority: RCW 19.28.060. 88-16-002 (Order 88-15), § 296-401-080, filed 7/21/88. Statutory Authority: RCW 19.28.060, 19.28.600 and chapter 19.28 RCW. 86-18-041 (Order 86-23), § 296-401-080, filed 8/29/86. Statutory Authority: RCW 19.28.060. 81-06-037 (Order 81-5), § 296-401-080, filed 2/27/81, effective 4/1/81. Statutory Authority: RCW 18.37.130. 80-02-052 (Order 80-1), § 296-401-080, filed 1/16/80.]

**WAC 296-401-085 Eligibility for specialty examination.** A person holding an electrical trainee certificate who has: (1) Been employed in the appropriate specialty under the direct supervision of a journeyman electrician or an appropriate specialty electrician for a minimum of two years, or (2) has completed a two year apprenticeship program in the electrical construction trade that is registered with the state apprenticeship council or the Federal Bureau of Apprenticeship and Training in the appropriate specialty, shall be eligible to take the examination for a specialty electrician certificate of competency.

[Statutory Authority: RCW 19.28.060. 88-16-002 (Order 88-15), § 296-401-085, filed 7/21/88.]

**WAC 296-401-087 Partial credit for experience.**

(1) A person holding a journeyman electrician certificate in a country outside the United States of America that requires at least four years of training shall be granted two years credit toward a journeyman certificate. An additional two years training under the direct supervision of a journeyman electrician is necessary to qualify to take the journeyman electrician certificate of competency examination.

(2) A person who has two years or more training or experience in a specialized electrical field in the Armed Forces of the United States that is similar to, but not identical to, a specialty electrician category under WAC 296-401-060 shall be granted one year experience. An additional year of work experience in the appropriate specialty under the direct supervision of a journeyman or specialty electrician is necessary to qualify to take a specialty examination.

[Statutory Authority: RCW 19.28.060. 88-16-002 (Order 88-15), § 296-401-087, filed 7/21/88.]

**WAC 296-401-090 Status of person who has failed an examination for an electrician certificate of competency.** (1) A person who fails an examination for an electrician certificate of competency may take a training or refresher course that has been approved by the electrical board and may work in the electrical construction trade only if the person has a valid electrician training certificate or temporary permit. A person is eligible to retake an examination upon application and payment of applicable fees only upon satisfactory completion of an approved electrician training or refresher course.

(2) A person who has a training certificate and/or who is taking a refresher course shall work only under the supervision of a certificated electrician.

(3) Upon application, the department may issue an electrician training certificate to a person who has failed an examination for a certificate of competency, only if the person furnishes evidence of enrollment in an electrician training or refresher course which is approved by

the electrical board. To be eligible to renew the training certificate, the person must furnish evidence of, (a) successfully completing the electrician training or refresher course, and (b) failing the certificate of competency again.

[Statutory Authority: RCW 19.28.060. 88-16-002 (Order 88-15), § 296-401-090, filed 7/21/88. Statutory Authority: RCW 19.28.060, 19.28.600 and chapter 19.28 RCW. 86-18-041 (Order 86-23), § 296-401-090, filed 8/29/86. Statutory Authority: RCW 18.37.130. 80-02-052 (Order 80-1), § 296-401-090, filed 1/16/80.]

**WAC 296-401-100 Computation of years of employment--Renewal of training certificates.** (1) For the purposes of RCW 19.28.530, 1800 hours of employment shall be considered one year of employment.

(2) At the time of renewal of an electrical training certificate, the holder shall provide the department with an accurate list of the holder's employers in the electrical industry for the previous year, the specialty the holder worked in and the number of hours worked for each employer in each specialty.

(3) The employer or apprenticeship program director shall upon request by the holder of the training certificate furnish an accurate list of the hours worked by the holder within twenty days of the request.

(4) A person who has completed a four year apprenticeship program in the electrical construction trade that is registered with the state apprenticeship council or the Federal Bureau of Apprenticeship and Training shall be considered to have completed 7200 hours (four years) of employment.

[Statutory Authority: RCW 19.28.060. 88-16-002 (Order 88-15), § 296-401-100, filed 7/21/88. Statutory Authority: RCW 19.28.060, 19.28.600 and chapter 19.28 RCW. 86-18-041 (Order 86-23), § 296-401-100, filed 8/29/86. Statutory Authority: RCW 19.28.060. 81-06-037 (Order 81-5), § 296-401-100, filed 2/27/81, effective 4/1/81. Statutory Authority: RCW 18.37.130. 80-02-052 (Order 80-1), § 296-401-100, filed 1/16/80.]

**WAC 296-401-110 Previous experience credit.** A person who is applying for an electrical trainee certificate who has already worked in electrical construction before September 1, 1979 shall receive credit for all electrical work previously performed toward the hours required for the examination.

[Statutory Authority: RCW 18.37.130. 80-02-052 (Order 80-1), § 296-401-110, filed 1/16/80.]

**WAC 296-401-120 Electrical training certificates.**

(1) The department upon proper application and verification shall issue separate electrical training certificates for the first, second, third, and fourth years of training. If a person has 1800 hours of employment or less in the electrical construction trade, the department shall issue the individual a first year certificate; if more than 1800 through 3600 hours, a second year certificate; if more than 3600 through 5400 hours, a third year certificate; and if more than 5400 hours a fourth year certificate.

(2) A holder of an electrical training certificate may apply for the next year's certificate whenever he or she has sufficient hours of employment.

(3) A holder of an electrical training certificate may apply for authorization to work without supervision if he

or she has over 6299 hours of employment, and has successfully completed or is currently enrolled in an approved apprenticeship program or in a technical school program in the electrical construction trade in a school approved by the superintendent of public instruction.

(4) The department shall not issue an electrical training certificate to a person who is eligible for a temporary or reciprocal electrician certificate of competency.

[Statutory Authority: RCW 19.28.060, 88-16-002 (Order 88-15), § 296-401-120, filed 7/21/88. Statutory Authority: RCW 19.28.060, 19.28.600 and chapter 19.28 RCW. 86-18-041 (Order 86-23), § 296-401-120, filed 8/29/86. Statutory Authority: RCW 18.37.130, 80-02-052 (Order 80-1), § 296-401-120, filed 1/16/80.]

**WAC 296-401-150 Penalties for false statements or material misrepresentation.** All applications required under chapter 19.28 RCW and the annual statement of hours of employment required under RCW 19.28.510, shall be made under oath. A person who knowingly makes a false statement or material misrepresentation on an application or statement may be referred to the county prosecutor for criminal prosecution under RCW 9A.72.020, 9A.72.030, and 9A.72.040. The department may also file a civil action under RCW 19.28.620 and may subtract up to 900 hours of employment from a trainee's total hours, if the department determines the trainee has made a false statement or material misrepresentation.

[Statutory Authority: RCW 19.28.060, 81-06-037 (Order 81-5), § 296-401-150, filed 2/27/81, effective 4/1/81. Statutory Authority: RCW 18.37.130, 80-02-052 (Order 80-1), § 296-401-150, filed 1/16/80.]

**WAC 296-401-160 Enforcement.** (1) The department shall ensure that employers and employees subject to chapter 19.28 RCW comply with that chapter and chapter 296-401 WAC by inspecting electrical job sites. The inspections shall be made by the department's compliance officers, or electrical inspectors.

(2) The compliance officer or electrical inspector shall determine whether:

(a) Each person doing electrical work on the job site has a proper journeyman, specialty, or trainee certificate;

(b) The ratio of the certified journeyman electricians to the certified trainees on the job site is correct; and

(c) Each certified trainee is directly supervised by an individual with a journeyman or proper specialty certificate of competency for the type of electrical work being performed.

(3) If the compliance officer or electrical inspector determines that an employer or employee has violated chapter 19.28 RCW or chapter 296-401 WAC, the department shall issue a citation that describes the reason the employer or employee has violated chapter 19.28 RCW or chapter 296-401 WAC. If an employer or employee continues to violate chapter 19.28 RCW or chapter 296-401 WAC, the department electrical inspectors or compliance officers may issue a cease and desist order.

(4) The employer or employee to whom a citation or cease and desist order is directed may request a hearing

pursuant to RCW 19.28.620; however, the request shall not stay the effect of the citation or cease and desist order. If the employer or employee disobeys the cease and desist order, the department shall apply to the superior court for a court order enforcing the cease and desist order. If the employer or employee disobeys the court order, the department shall request the attorney general to apply to the superior court for an order holding the employer or employee in contempt of court.

[Statutory Authority: RCW 19.28.060, 19.28.600 and chapter 19.28 RCW. 86-18-041 (Order 86-23), § 296-401-160, filed 8/29/86. Statutory Authority: RCW 19.28.120 and 19.28.510, 83-23-053 (Order 83-32), § 296-401-160, filed 11/14/83. Statutory Authority: RCW 19.28.060, 81-06-037 (Order 81-5), § 296-401-160, filed 2/27/81, effective 4/1/81. Statutory Authority: RCW 18.37.130, 80-02-052 (Order 80-1), § 296-401-160, filed 1/16/80.]

**WAC 296-401-165 Issuing and renewing an electrician certificate of competency.** (1) The department shall issue an electrician certificate of competency to journeyman or specialty electricians who meet the qualifications in RCW 19.28.530 and who have successfully passed a certification examination in accordance with RCW 19.28.540.

(2) The electrician certificate of competency shall expire on the holder's birthdate at least one year and not more than three years from the date of original issue. All subsequent certificates shall be issued for a two year period. If the person was born in an even numbered year, the certificate shall expire on the holder's even numbered birthdate. If the person was born in an odd numbered year, the certificate shall expire on the holder's odd numbered birthdate. The department shall prorate the electrician fee according to the number of months or major part of a month in a certificate period.

(3) An individual who successfully passes an examination for a certificate of competency, shall apply for a certificate of competency within thirty days of the date the person is notified about the results of the examination. A person who does not apply for a certificate of competency within thirty days of the date the person is notified about the results of the examination, shall be required to apply for, take and pass the examination again.

[Statutory Authority: RCW 19.28.060, 19.28.600 and chapter 19.28 RCW. 86-18-041 (Order 86-23), § 296-401-165, filed 8/29/86. Statutory Authority: RCW 19.28.120 and 19.28.510, 83-23-053 (Order 83-32), § 296-401-165, filed 11/14/83.]

**WAC 296-401-168 Reciprocal electrician certificates.** The department shall issue a reciprocal electrician certificate to an electrician coming into the state of Washington from another state who meets the eligibility requirement in RCW 19.28.530 in accordance with the following conditions:

(1) The department has a valid reciprocal agreement with another state in the journeyman or specialty category requested.

(2) The application shall be made on forms prescribed by the department.

(3) The person shall furnish evidence that he or she meets the eligibility requirements in RCW 19.28.530.

(4) The applicant shall pay a fee with the application which shall equal the electrician certification examination application fee and the certificate fee as determined in accordance with chapter 296-401 WAC.

(5) The applicant must have obtained a certificate of competency for which reciprocity is requested while a resident of another state.

(6) A person is not eligible for a reciprocal electrician certificate who has taken an examination to obtain a certificate of competency in the state of Washington, who has failed an examination for a certificate of competency in the state of Washington or who has failed to renew a certificate of competency in accordance with chapter 19.28 RCW.

[Statutory Authority: RCW 19.28.060, 19.28.600 and chapter 19.28 RCW. 86-18-041 (Order 86-23), § 296-401-168, filed 8/29/86.]

#### WAC 296-401-170 Hearing or appeal procedure.

(1) An employer or employee to whom a citation or cease and desist order is directed; a person who is aggrieved by the department's suspension or revocation of a trainee, journeyman, or specialty certificate; or the denying an application to take an examination for a certificate; or a person who has had his or her hours reduced pursuant to WAC 296-401-150; may request a formal or informal hearing before the electrical board within fifteen days from receipt of the citation, cease and desist order, the suspension or revocation of a certificate, denial of an application, or the reduction of hours.

(2) The formal appeal shall be made in writing to the department chief electrical inspector and shall state the action by the department that is being appealed and the relief that is desired and shall be accompanied by a certified check in the amount of two hundred dollars made payable to the department. The deposit shall be returned to the aggrieved party if the decision of the department is not sustained or upheld. If the decision of the department is sustained or upheld, the deposit shall be used to pay the expenses of holding the hearing and any balance remaining after payment of the hearing expenses shall be paid into the electrical license fund. The formal appeal shall be assigned to an administrative law judge and shall be held in conformance with the requirements of the Administrative Procedure Act, chapter 34.04 RCW. Findings of fact, conclusions of law, and a decision are given as a result of a formal appeal.

(3) The electrical board will hear informal appeals from persons who desire to contest a decision of the department. Informal appeals will be heard by the board at a regular or special board meeting. An informal appeal shall be made in writing to the department chief electrical inspector and shall state the action by the department that is being appealed and the relief that is desired. An informal decision is given as a result of an informal appeal.

(4) See chapter 296-13 WAC for additional information on appeals before the electrical board.

[Statutory Authority: RCW 19.28.060, 88-16-002 (Order 88-15), § 296-401-170, filed 7/21/88. Statutory Authority: RCW 19.28.060, 19.28.600 and chapter 19.28 RCW. 86-18-041 (Order 86-23), § 296-401-170, filed 8/29/86. Statutory Authority: RCW 18.37.130, 80-02-052 (Order 80-1), § 296-401-170, filed 1/16/80.]

#### WAC 296-401-175 Journeyman, specialty and trainee certificate, and examination fees.

(1) Journeyman or specialty electrician certificate (per 24-month period) -	\$ 24
(2) Late renewal of journeyman or specialty electrician certificate (per 24-month period) -	\$ 48
(3) Journeyman or specialty electrician examination application (nonrefundable) -	\$ 20
(4) Journeyman or specialty electrician examination -	\$ 30
(5) Trainee certificate (expires one year after purchase) -	\$ 12

[Statutory Authority: RCW 19.28.060, 19.28.600 and chapter 19.28 RCW. 86-18-041 (Order 86-23), § 296-401-175, filed 8/29/86. Statutory Authority: RCW 19.28.060 and 19.28.210, 85-20-065 (Order 85-16), § 296-401-175, filed 9/27/85. Statutory Authority: RCW 19.28.120 and 19.28.510, 83-23-053 (Order 83-32), § 296-401-175, filed 11/14/83.]

WAC 296-401-180 Examination subjects for specialty and journeyman certificates of competency. The following subjects are among those that may be included in the examination for a certificate of competency. The list is not exclusive, and the test may also contain subjects not in the list.

#### JOURNEYMAN ELECTRICIAN EXAMINATIONS MAY BE BASED ON THE SUBJECTS FOR SPECIALTY ELECTRICIAN EXAMINATIONS IN ADDITION TO THESE SUBJECTS:

- AC - Generator; three-phase; meters; characteristics of; power in AC circuits (power factor); mathematics of AC circuits
- Air conditioning - Basic
- Blueprints - Surveys and plot plans; floor plans; service and feeders; Electrical symbols; elevation views; plan views
- Building wire - Sizes
- Cable trays
- Calculations
- Capacitive reactance
- Capacitor - Types; in series and parallel
- Circuits - Series; parallel; combination; basic; branch; outside branch circuits; calculations
- Conductor - Voltage drop (line loss); grounded
- Conduit - Wiring methods
- DC - Generator; motors; construction of motors; meters
- Definitions
- Electrical units
- Electron theory
- Fastening devices
- Fire alarms - Introduction to; initiating circuits
- Fuses
- Generation - Principles of
- Grounding
- Incandescent lights
- Inductance - Introduction to; reactance
- Insulation - of wire

Mathematics – Square root; vectors' figuring percentages  
 Motors – Motors vs. Generators/CEMF; single phase;  
 capacitor; repulsion; shaded pole; basic principles of AC motors  
 Ohm's Law  
 Power  
 Power factor – AC circuits; correction of; problems  
 Rectifiers  
 Resistance – of wire  
 Rigging  
 Safety – Electrical shock  
 Services  
 Three-wire system  
 Tools  
 Transformers – Principles of; types; single phase; three-phase connections  
 Voltage polarity across a load  
 Wiring methods – Conduit; general  
 Wiring systems – Less than 600 volts; 480/277 volts; three-phase delta or wye; distribution systems over 600 volts.

**SPECIALTY ELECTRICIAN EXAMINATIONS MAY BE BASED ON THESE SUBJECTS:**

AC – Meters  
 Appliance circuits or controls  
 Blueprints – Floor plans; service and feeders  
 Cables – Wiring methods  
 Calculations  
 Circuits – Series; parallel; combination; basic; outside branch  
 Conductor – Voltage drop (line loss); grounded; Aluminum or copper  
 Conduit – Wiring methods  
 Electrical signs, circuits, controls, or services  
 Electrical units  
 First aid  
 Fuses  
 General lighting  
 Grounding of conductors  
 Insulation of wire  
 Ladder safety  
 Limited energy circuits or systems  
 Maintenance of electrical systems  
 Mathematics – Figuring percentage  
 Motor circuits, controls, feeders, or services  
 Ohm's Law  
 Overcurrent protection  
 Resistance of wire  
 Services  
 Sizes of building wire  
 Three-wire system  
 Tools  
 Transformer – Ratios; single-phase

[Statutory Authority: RCW 19.28.060, 88-16-002 (Order 88-15), § 296-401-180, filed 7/21/88; 81-06-037 (Order 81-5), § 296-401-

180, filed 2/27/81, effective 4/1/81. Statutory Authority: RCW 18-37.130, 80-02-052 (Order 80-1), § 296-401-180, filed 1/16/80.]

**Chapter 296-402 WAC  
 ELECTRICAL TESTING LABORATORY  
 ACCREDITATION**

WAC	
296-402-010	Foreword.
296-402-020	Purpose and scope.
296-402-030	Definitions.
296-402-040	Organization.
296-402-050	Professional and ethical business practices.
296-402-060	Quality control system.
296-402-070	Personnel.
296-402-080	Calibration—Verification and maintenance of facilities and equipment.
296-402-090	Plans for certification programs.
296-402-100	Records.
296-402-110	Product certification program.
296-402-120	Product assurance (follow-up) activities.
296-402-130	Laboratory approval program implementation.
296-402-140	Initial laboratory evaluation.
296-402-150	Renewals.
296-402-160	Conditions of accreditation.
296-402-170	Penalties.
296-402-180	Notification of change.
296-402-190	Revocation and suspension procedures.
296-402-200	Appeal procedures.

**WAC 296-402-010 Foreword.** This chapter is promulgated in accordance with the provisions of chapter 19.28 RCW which covers electricians and electrical installations.

To qualify for certification as an approved electrical products testing laboratory, the criteria of this chapter shall be complied with.

[Statutory Authority: RCW 19.28.010, 19.28.060, 19.28.065 and 19.28.070, 85-20-130 (Order 85-27), § 296-402-010, filed 10/2/85.]

**WAC 296-402-020 Purpose and scope.** The purpose of this chapter is to provide for recognition and accreditation of electrical products testing and certification laboratories for the state of Washington so the general consuming public can be assured that electrical products have been tested for safety and identified for their intended use.

Any electrical product, device, system, material, or installation which is accepted, or classified, identified, or certified, or listed, or labeled by a Washington state accredited electrical products testing laboratory shall be deemed to have been successfully evaluated for safety.

[Statutory Authority: RCW 19.28.010, 19.28.060, 19.28.065 and 19.28.070, 85-20-130 (Order 85-27), § 296-402-020, filed 10/2/85.]

**WAC 296-402-030 Definitions.** The definitions set forth in this section shall apply throughout this chapter.

(1) "ANSI" means American National Standards Institute.

(2) "Board" means the electrical board established pursuant to RCW 19.28.065. The term "board" also includes an administrative law judge or board member appointed by the board to hear an appeal.

(3) "Certified electrical product" means an electrical product that is certified under this chapter:

(a) To which a label, symbol, or other identifying mark of an approved testing laboratory has been attached to indicate that the manufacturer produced the product in compliance with appropriate standards or that the product performs in a specified manner.

(b) That is not decertified.

(4) "Certification mark" means a specified approved testing laboratory identification indicating that a certified electrical product has been manufactured in accordance with the requirements of appropriate standards or tested for specific end uses.

(5) "Certification program" means a specified set of testing, inspection, and quality assurance procedures, with appropriate implementing authority directed toward evaluating products for certification of compliance to the requirements of appropriate standards.

(6) "Department" means the department of labor and industries.

(7) "Electrical board" means the board established pursuant to RCW 19.28.065. The term "electrical board" also includes an administrative law judge or board member appointed by the board to hear an appeal.

(8) "Labeled" means an electrical product to which a label, symbol, or other identifying mark of an approved laboratory is attached.

(9) "Laboratory operations control manual" means a document consisting of specified procedures and information for each test method responding to the application requirements of the product standard.

(10) "Quality control manual" means a document consisting of general guidelines for the quality control of the laboratory's method of operation. Specific information is provided for portions of individual test methods whenever specifics are needed to comply with the criteria or otherwise support the laboratory's operations.

[Statutory Authority: RCW 19.28.060, 88-16-002 (Order 88-15), § 296-402-030, filed 7/21/88. Statutory Authority: RCW 19.28.010, 19.28.060, 19.28.065 and 19.28.070, 85-20-130 (Order 85-27), § 296-402-030, filed 10/2/85.]

**WAC 296-402-040 Organization.** The laboratory shall be an independent, third-party testing and inspection organization with no organizational, managerial, or financial affiliation with manufacturers, suppliers, or vendors of products covered under its certification programs.

(1) The laboratory shall not be owned by manufacturers or vendors.

(2) The laboratory administration shall not be controlled by manufacturers or vendors.

(3) The laboratory shall be legally constituted and permitted to perform certification work.

(4) The laboratory shall not be engaged in the promotion or design of the product being evaluated, tested, or certified.

(5) The laboratory shall have sufficient diversity of clients or activity so that the loss or award of a specific contract regarding certification would not be a determinative factor in the financial well-being of the laboratory.

(6) The employment security status of the personnel of the laboratory shall be free of influence or control of manufacturers or vendors of products certified.

[Statutory Authority: RCW 19.28.010, 19.28.060, 19.28.065 and 19.28.070, 85-20-130 (Order 85-27), § 296-402-040, filed 10/2/85.]

**WAC 296-402-050 Professional and ethical business practices.** The laboratory shall be operated in accordance with generally accepted professional and ethical business practices and shall agree in writing that as a minimum it will be its policy to:

(1) Perform the examinations, tests, evaluations, and inspections required under the certification programs in accordance with the designated standards and procedures.

(2) Assure that reported values accurately reflect measured data.

(3) Limit work to that for which competence and capacity are available.

(4) Treat test data, records, and reports as proprietary information.

(5) Respond and attempt to resolve complaints concerning test results and certifications.

(6) Be capable of performing all examinations, tests, evaluations, and inspections for certification programs for which it is approved according to the latest effective version of applicable safety standards as adopted by rule, and require that all certified products produced after the effective date comply with such standards.

(7) Maintain an independent relationship between its clients, affiliates, or other organizations, so that the laboratory's capacity to render test reports and certifications objectively and without bias is not adversely affected.

(8) Notify the department within thirty calendar days should it become unable to conform to any of these criteria.

[Statutory Authority: RCW 19.28.010, 19.28.060, 19.28.065 and 19.28.070, 85-20-130 (Order 85-27), § 296-402-050, filed 10/2/85.]

**WAC 296-402-060 Quality control system.** The laboratory shall maintain a quality control system to help assure the accuracy and technical integrity of its work as follows:

(1) The laboratory's quality control system must include a quality control manual or a laboratory operations control manual containing written procedures and information in response to the applicable requirements of the product standard. The procedures and information may be explicitly contained in the manual or may be referenced so that their location in the laboratory is clearly identified. The written procedures and information must be adequate to guide a testing technician and inspector in conducting the tests and inspections in accordance with the test methods and procedures required for the certification programs for which accreditation is sought.

(2) The laboratory shall have a current copy of its quality control manual available in the laboratory for use by laboratory personnel and shall make the manual available to the department for review and audit.

[Statutory Authority: RCW 19.28.010, 19.28.060, 19.28.065 and 19.28.070. 85-20-130 (Order 85-27), § 296-402-060, filed 10/2/85.]

**WAC 296-402-070 Personnel.** The laboratory shall be staffed by competent personnel who shall have the necessary education, training, technical knowledge, and experience for their assigned functions to perform the tests, examinations, reevaluations, and inspections for certification programs for which accreditation is sought.

(1) There shall be a job description for each senior technical position category.

(2) The laboratory shall assure the competency of its staff through the observation and/or examination of each relevant staff member in the performance of tests, examinations, and inspections that each member is assigned to perform. The observations must be conducted at intervals not exceeding one year by one or more individuals judged qualified by the person who has technical responsibility for the operation.

(3) The laboratory shall make available the description of its training program for assuring that new or untrained staff will be able to perform tests and inspections properly and uniformly to the requisite degree of precision and accuracy.

(4) The laboratory shall maintain records, including dates of the observation or examination of performance of personnel. Information on the relevant qualifications, training, and experience of the technical staff shall be maintained by the laboratory and shall be furnished to the department on request.

[Statutory Authority: RCW 19.28.010, 19.28.060, 19.28.065 and 19.28.070. 85-20-130 (Order 85-27), § 296-402-070, filed 10/2/85.]

**WAC 296-402-080 Calibration--Verification and maintenance of facilities and equipment.** The laboratory shall provide evidence of the calibration, verification, and maintenance of the facilities and equipment specified for each test method for certification programs for which accreditation is sought by means of the following:

(1) A description of the procedures used in calibrating, verifying, and maintaining the test equipment and facilities, including as applicable:

(a) Calibration and verification equipment or services used;

(b) Reference standards and materials used;

(c) Measurement assurance, corroborative reference, or other programs in which the laboratory participates; and

(d) Specified maintenance practices.

(2) Calibration and verification records, including as applicable:

(a) Equipment description or name;

(b) Name of manufacturer;

(c) Model, style, and serial number, or other identification;

(d) Equipment variables subject to calibration and verification;

(e) Statement of the instrument's allowable error and tolerances of readings;

(f) Calibration or verification schedule (intervals);

(g) Dates and results of last calibrations or verifications and schedule of future calibrations or verifications;

(h) Name of laboratory person or outside contractor providing the calibration or verification services; and

(i) Traceability to National Bureau of Standards or other standard reference authority as required.

[Statutory Authority: RCW 19.28.010, 19.28.060, 19.28.065 and 19.28.070. 85-20-130 (Order 85-27), § 296-402-080, filed 10/2/85.]

**WAC 296-402-090 Plans for certification programs.** The laboratory shall maintain plans for its certification programs for which accreditation is sought which shall include, as applicable, instructions for:

(1) Equipment maintenance and verification checks.

(2) Sample selection.

(3) Data collection, analysis, and reporting.

(4) Quality control checks and audits.

[Statutory Authority: RCW 19.28.010, 19.28.060, 19.28.065 and 19.28.070. 85-20-130 (Order 85-27), § 296-402-090, filed 10/2/85.]

**WAC 296-402-100 Records.** The laboratory shall maintain records and prepare reports of those testing, inspection, and certification activities associated with each program for which approval is sought. The laboratory shall make available to the department, upon request, a typical completed test or inspection report with the name of the client and source of any product deleted. Test and inspection reports shall contain, as applicable:

(1) Name and address of the laboratory.

(2) Pertinent data and identification of tests or inspections.

(3) Name of client.

(4) Description and identification of the sample including, as necessary, where and how the sample was selected.

(5) An appropriate title.

(6) Identification of the test, inspection, or procedure as specified for the certification program.

(7) Known deviations, additions to, or exclusions from testing, inspection, and certification activities in order to be appropriate to new or innovative products not contemplated by the standard.

(8) Measurements, examinations, derived results, and identification of test anomalies.

(9) If necessary, a statement as to whether or not the results comply with the requirements of the standard.

(10) Signature of person(s) having responsibility for the report.

(11) Data generated during testing if not included in the test report, such as raw data, calculations, tables, graphs, sketches, and photographs, shall be maintained.

(12) Sample control forms documenting the receipt, handling, storage, shipping, and testing of samples or a written description of the procedures and separate records that are maintained to control these operations.

(13) The laboratory shall have copies of applicable standards and other documents referred to or used in performing each test or inspection for product certification for which approval is sought.

(14) The laboratory shall maintain records of its quality control checks and audits for monitoring its test



work associated with its certification programs, including:

(a) Records of products assurance (follow-up) test results; and

(b) Records of detected errors and discrepancies and actions taken subsequent to such detection.

(15) The laboratory shall maintain a record of written complaints and disposition thereof.

(16) The laboratory shall retain records required by these criteria for a minimum of three years.

[Statutory Authority: RCW 19.28.010, 19.28.060, 19.28.065 and 19.28.070. 85-20-130 (Order 85-27), § 296-402-100, filed 10/2/85.]

**WAC 296-402-110 Product certification program.**

(1) General. The testing laboratory shall be approved only to certify those products identified by the laboratory in its application and as authorized by the department. The certification program shall contain the procedures and authority to ensure that the certified product complies with the standards (requirements) established by the program.

(2) Electrical product safety standard used. The standard used as the basis of the certification program shall be a state approved product safety standard that is determined to provide an adequate level of safety or define an adequate level of safety performance.

(a) Generally, such standards shall:

(i) Be recognized in the United States as an electrical product safety standard.

(ii) Be compatible with and be maintained current with periodic revisions of applicable national codes and installation standards.

(iii) Be developed by a standards developing organization under a method providing for input and consideration of views of industry groups, experts, users, consumers, and governmental authorities, and others having broad experience in the electrical products safety field.

(b) All ANSI safety designated electrical product standards are deemed acceptable without further qualification.

(c) If a testing laboratory desires to use a published standard other than an ANSI standard, the department shall evaluate the proposed standard to determine that it provides an adequate level of safety. If there exists an ANSI standard, or other published standard meeting the criteria of (a) of this subsection which has been recognized by the department for use in certification programs, the laboratory shall identify and justify all differences between the proposed standard and such ANSI standard or other standard previously recognized by the department.

(d) Where there is no published standard meeting the above cited criteria for the equipment under consideration, the department shall evaluate the proposed standard to determine that it provides an adequate level of safety. The laboratory shall identify and justify the adequacy of the standard or other specifications used as a source of requirements.

(e) The department shall review proposed standards to determine that they provide an adequate level of safety

and shall present a recommendation concerning each proposed standard to the electrical advisory board at a regular or special board meeting for the board's approval.

(3) Evaluation of components. Components of certified products shall be evaluated for compliance with standards applicable to such components or found to be suitable for use in the product as stated in the end product standard.

(4) Certification agreement. Measures, such as the following, to provide for manufacturer compliance with the provisions of the product standard and laboratory control of the use of the certification mark shall be embodied in an agreement between the manufacturer and the testing laboratory:

(a) Require the manufacturer to provide such information and assistance as needed by the testing laboratory to conduct the necessary product conformity and production assurance evaluation.

(b) Require the manufacturer to provide the testing laboratory's representative access during working hours to the factory for inspection and audit activities without prior notice.

(c) Restrict the manufacturer to application of certification marks only to products that comply with requirements of the product standard.

(d) Secure the manufacturer's agreement to the publication of notice by the testing laboratory for any product already available in the marketplace that does not meet the safety standard.

(e) Whenever the standard covering the product is revised, require reevaluation of products as a condition of continued use of the certification mark.

(f) Provide for notification by the laboratory of the manufacturer's personnel responsible for and authorized to institute product recall in the case of a hazard.

(g) Provide for control of certification marks (or labels) by the testing laboratory.

(h) Require that the testing laboratory provide to the manufacturer a report of original product evaluation, which documents by test results and other data, when conformity with the applicable product standard is achieved.

(i) Require the manufacturer to provide the identification of the manufacturer or vendor of the product, and, if the product is produced in more than one location, the place of manufacture of the product.

(5) Identification of certified products. Certified products shall be labeled or marked with the certification mark of the approved testing laboratory. The certification mark shall:

(a) Be owned by the testing laboratory and be registered as a certification mark with the United States Patent and Trademark Office.

(b) Not be readily transferable from one product to another.

(c) Be directly applied to each unit of production in the form of labels or markings suitable for the environment and use of the product, except where the physical size of the unit does not permit, in which case markings



may then be attached to the smallest package in which the unit is marketed.

(d) Include the name or other appropriate identification of the testing laboratory.

(e) Include the product category where such is not completely obvious.

(6) Directory (list) of certified products. The testing laboratory shall publish annually a products directory to identify products that are authorized to bear the laboratory's certification mark (label). The products directory shall briefly describe the program, the products covered, the name of the manufacturer or vendor of the certified products, and the identification of the published standards or the compiled requirements on which the program is based. The products directory shall be available to the public. Supplemental up-to-date information shall be publicly available at the office of the testing laboratory at any time during normal business hours.

(7) Original conformance (engineering) evaluation. Prior to authorizing the use of a certification mark on a product, the testing laboratory shall:

(a) Determine by examination and/or tests that representative samples of the product comply with the requirements (standards). Components of certified products shall also be required to comply with the safety standards (requirements) applicable to such components or found to be suitable for use as stated in the end product standard. Evaluation of the product design shall be made on representative production samples or on prototype product samples with subsequent verification that factory productions are the same as the prototype.

(b) Determine that the manufacturer has the necessary facilities, test equipment, and control procedures to ensure that continuing production of the product complies with the requirements.

[Statutory Authority: RCW 19.28.010, 19.28.060, 19.28.065 and 19.28.070. 85-20-130 (Order 85-27), § 296-402-110, filed 10/2/85.]

**WAC 296-402-120 Product assurance (follow-up) activities.** (1) General. Concurrent with and subsequent to authorizing the manufacturer to use the testing laboratory's certification mark, the testing laboratory shall establish a factory follow-up inspection program to determine continued compliance of certified products with the applicable standard.

(2) Follow-up inspection manual. The testing laboratory shall prepare and utilize an inspection manual setting forth the conditions governing the use of the certification mark on the products. The inspection manual shall include the identification of the products authorized for certification; identification of manufacturer and plant location at which manufacture and certification are authorized; description, specifications, and requirements applicable to the product; description of processes where needed for control purposes; description of the manufacturer's quality assurance program when used as part of the follow-up program; description of inspections and tests to be conducted by the manufacturer and the inspector; description of countercheck tests to be conducted in the laboratory; and description of the form and means of applying the certification mark.

(1989 Ed.)

(3) Follow-up procedures and activities. Follow-up procedures and activities shall include the following:

(a) Periodic unannounced inspections at the factory with testing at the factory or testing laboratory of representative samples selected from production and, if appropriate, from the market.

(b) Periodic auditing or surveillance of the manufacturer's quality assurance program through the witnessing of manufacturer's tests, review of the manufacturer's records, and verification of the manufacturer's produced data.

(c) Investigation of alleged field failures upon department request.

(d) Procedures for control of the use of the certification mark by:

(i) Keeping records of the release and use of certification marks.

(ii) Removal of marks from noncomplying products.

(iii) Return or destruction of unused marks when the authority to use the marks is terminated.

(iv) Legal action.

(e) Frequency of follow-up. The frequency of follow-up inspections shall be sufficient to provide a reasonable check on the means which the manufacturer exercises to assure that the product bearing the certification mark complies with the applicable standards. The frequency shall not be less than once each three months, unless adequate data is provided to the department to justify less frequent inspections.

[Statutory Authority: RCW 19.28.010, 19.28.060, 19.28.065 and 19.28.070. 85-20-130 (Order 85-27), § 296-402-120, filed 10/2/85.]

**WAC 296-402-130 Laboratory approval program implementation.** (1) The department may establish a standing committee for the purpose of recommending action regarding approval of electrical testing laboratories, and reviewing of applications, non-ANSI standards, and other technical criteria.

(2) The department shall develop forms and procedures which will enable applicants to submit the data necessary for evaluation.

(3) The department may waive on-site inspection for a testing laboratory showing evidence of current recognition by another state determined to provide an accreditation program acceptable to the department.

[Statutory Authority: RCW 19.28.010, 19.28.060, 19.28.065 and 19.28.070. 85-20-130 (Order 85-27), § 296-402-130, filed 10/2/85.]

**WAC 296-402-140 Initial laboratory evaluation.** (1) The department shall:

(a) Accept requests for testing laboratory certification.

(b) Make an administrative review to ensure completeness and accuracy of information.

(c) Review the request.

(d) Arrange for the laboratory on-site inspection by a technically qualified representative of the department to evaluate compliance with accreditation criteria. The cost shall be borne by the applicant.

[Title 296 WAC—p 2271]

(2) Notification of evaluation and evaluation results. The department shall notify the applicant of the recommendation of the department and time and place of the hearing to consider the request.

(3) Fees. There shall be an initial filing fee accompanying the application, an initial accreditation fee, and a biennial renewal fee as established from time to time by the department. Evaluation costs including travel expenses and any additional related expenses shall be borne by the laboratory. On-site inspections, requiring fees, shall not be made more than once a year, unless additional inspections are required by the department or requested by the laboratory.

Initial filing fee	\$ 500.00
Initial accreditation fee:	
One product category	\$ 250.00
Each additional category for the next nineteen categories	\$ 100.00 each
Maximum for twenty categories or more	\$2150.00
Biennial renewal fee	50% of the amount of the initial accreditation fee

(4) Number and category. Each accredited testing laboratory shall be identified by the number of electrical product category(ies) that the department has determined the laboratory is qualified to evaluate. The accreditation shall indicate the electrical product category(ies) for which accreditation is issued.

(5) Approval. The department shall accept or deny laboratory approval. Such approval shall be subject to reexamination when deemed necessary by the department.

[Statutory Authority: RCW 19.28.060, 88-16-002 (Order 88-15), § 296-402-140, filed 7/21/88. Statutory Authority: RCW 19.28.010, 19.28.060, 19.28.065 and 19.28.070, 85-20-130 (Order 85-27), § 296-402-140, filed 10/2/85.]

**WAC 296-402-150 Renewals.** At least thirty days prior to the expiration date of any such accreditation, the electrical testing laboratory shall forward to the department an application for renewal. The department, upon receipt of the completed form and fee, shall renew accreditation for a period of two years or notify such applicant of the department's refusal with reasons thereof. Accreditation may be renewed for one or more electrical product category(ies) and renewal may be refused for one or more electrical product category(ies).

[Statutory Authority: RCW 19.28.060, 88-16-002 (Order 88-15), § 296-402-150, filed 7/21/88. Statutory Authority: RCW 19.28.010, 19.28.060, 19.28.065 and 19.28.070, 85-20-130 (Order 85-27), § 296-402-150, filed 10/2/85.]

**WAC 296-402-160 Conditions of accreditation.** (1) Evidence of accreditation. The accreditation of any testing laboratory shall be evidenced by a letter of accreditation from the department.

(2) Period of accreditation. The accreditation of a testing laboratory shall be valid for a period of two years

from the date of acceptance by the department. The period of validity shall be stated in the letter of accreditation.

(3) Maintenance of qualifying conditions. Every accredited testing laboratory shall continue to satisfy all the conditions specified in this chapter during the period of the accreditation.

(4) Reports. The accredited laboratory shall furnish the department an annual report detailing the extent of its activities for the year, and covering the products which it has certified during the year. The report shall include information concerning:

- (a) The number of factory inspections.
- (b) List of certified products.

[Statutory Authority: RCW 19.28.010, 19.28.060, 19.28.065 and 19.28.070, 85-20-130 (Order 85-27), § 296-402-160, filed 10/2/85.]

**WAC 296-402-170 Penalties.** Any person and/or laboratory that fails to comply with the requirements of these rules and regulations or that files a false report may have accreditation revoked for one or more electrical product category(ies) and shall bear such cost which may accrue to the department or its agent(s) as a result of the violation. A laboratory whose accreditation has been revoked may apply again for accreditation no sooner than one year after the date of revocation of accreditation.

[Statutory Authority: RCW 19.28.010, 19.28.060, 19.28.065 and 19.28.070, 85-20-130 (Order 85-27), § 296-402-170, filed 10/2/85.]

**WAC 296-402-180 Notification of change.** Testing laboratories accredited under these rules and regulations shall notify the department within thirty working days of any of the following:

- (1) Change in company name and/or address.
- (2) Changes in major test equipment.
- (3) Changes in principal officers, key supervisory and responsible personnel in the company including the director of testing and engineering services, director of follow-up services, and the laboratory supervisor.
- (4) Change in the standard(s) covering the certified product(s).
- (5) Change in independent status.

[Statutory Authority: RCW 19.28.010, 19.28.060, 19.28.065 and 19.28.070, 85-20-130 (Order 85-27), § 296-402-180, filed 10/2/85.]

**WAC 296-402-190 Revocation and suspension procedures.** (1) Revocation and suspension. The department on its own initiative may suspend or revoke the accreditation of any testing laboratory found to be in noncompliance with these rules and regulations, the laws of the state of Washington, or having substantial evidence of the laboratory's conduct in unethical business practices.

(2) Notice and conference. Prior to suspension, revocation, or failure to renew the accreditation of a laboratory, written notice of such intent shall be served by certified mail by the department. Within fifteen calendar days of receipt of such notice, the affected laboratory may request a conference before the department. Should the electrical testing laboratory disagree with the decision of the department, an appeal may be made to

the electrical board, as provided for in WAC 296-402-200.

(3) Effect of suspension and revocation. If the accreditation is suspended, revoked, or not renewed, the laboratory shall immediately notify the involved manufacturers whose products are covered by the accreditation that such products manufactured subsequent to the revocation and offered for sale in the state of Washington can no longer bear the laboratory's label that identified it as a certified product.

[Statutory Authority: RCW 19.28.060. 88-16-002 (Order 88-15), § 296-402-190, filed 7/21/88. Statutory Authority: RCW 19.28.010, 19.28.060, 19.28.065 and 19.28.070. 85-20-130 (Order 85-27), § 296-402-190, filed 10/2/85.]

**WAC 296-402-200 Appeal procedures.** (1) An applicant or electrical product testing laboratory that disagrees with the action of the department regarding accreditation, qualification or approval or denial of product categories may appeal to the electrical board. An appeal shall be made in writing to the department chief electrical inspector as secretary to the board within fifteen days of receiving an adverse decision from the department. The written appeal shall state the decision of the department that is being appealed and the relief that is desired.

(2) A request for a formal appeal shall be accompanied by a certified check in the amount of two hundred dollars made payable to the department. The deposit shall be returned to the aggrieved party if the decision of the department is not sustained or upheld. If the decision of the department is sustained or upheld, the deposit shall be used to pay the expenses of holding the hearing and any balance remaining after payment of the hearing expenses shall be paid into the electrical license fund. The formal appeal shall be held in conformance with the requirements of the Administrative Procedure Act, chapter 34.04 RCW, and will be heard at a regular or special board meeting, at a special hearing date or may be assigned by the board to an administrative law judge.

(3) An informal appeal will be heard by the board at a regular or special board meeting.

(4) See chapter 296-13 WAC for additional information on appeals before the electrical board.

[Statutory Authority: RCW 19.28.060. 88-16-002 (Order 88-15), § 296-402-200, filed 7/21/88.]

### Chapter 296-403 WAC

#### AMUSEMENT RIDES OR STRUCTURES

##### WAC

296-403-010	Definitions.
296-403-020	Insurance.
296-403-030	Application for operating permit.
296-403-040	Operating permit.
296-403-050	Temporary operating permit.
296-403-060	Fees.
296-403-070	Appeals.
296-403-080	Amusement ride inspector qualifications.
296-403-090	Safety and maintenance seminar.
296-403-100	On-site examination.
296-403-110	On-site examination content.
296-403-120	Reciprocal certificate.

296-403-130	Insurance company amusement ride inspector.
296-403-140	Revocation of certification of amusement ride inspectors—Reinstatement.
296-403-150	Fees for examination, certification, and renewal of certification for inspectors.

**WAC 296-403-010 Definitions.** (1) "Amusement structure" means any electrical or mechanical devices or combinations thereof operated for revenue and to provide amusement or entertainment to viewers or audiences at carnivals, fairs, or amusement parks. "Amusement structure" does not include games in which a member of the public must perform an act, nor concessions at which customers may make purchases.

(2) "Amusement ride" means any vehicle, boat, or other mechanical device moving upon or within a structure, along cables or rails, through the air by centrifugal force or otherwise, or across water, that is used to convey one or more individuals for amusement, entertainment, diversion, or recreation. "Amusement ride" includes, but is not limited to, devices commonly known as skyrides, ferris wheels, carousels, parachute towers, tunnels of love, and roller coasters. "Amusement ride" shall not include: (a) Conveyances for persons in recreational winter sports activities such as ski lifts, ski tows, j-bars, t-bars, and similar devices subject to regulation under chapter 70.88 RCW; (b) any single-passenger coin-operated ride that is manually, mechanically, or electrically operated and customarily placed in a public location and that does not normally require the supervision or services of an operator; (c) nonmechanized playground equipment, including but not limited to, swings, seesaws, stationary spring-mounted animal features, rider-propelled merry-go-rounds, climbers, slides, trampolines, and physical fitness devices; or (d) water slides.

(3) "Board" means the electrical board established pursuant to RCW 19.28.065. The term "board" also includes an administrative law judge or board member(s) appointed by the board to hear an appeal.

(4) "Electrical board" means the board established pursuant to RCW 19.28.065. The term "electrical board" also includes an administrative law judge or board member(s) appointed by the board to hear an appeal.

(5) "Department" means the department of labor and industries.

(6) "Insurance policy" means an insurance policy written by an insurer authorized to do business in this state under Title 48 RCW.

(7) "Certificate of inspection" means a document given under oath or affirmation from an insurer or a person with whom the insurer has contracted to make a mechanical safety inspection of the amusement ride or structure. The certificate shall contain the name, address and notarized signature of the inspector, the complete description of the amusement ride or structure and the name and address of the owner or operator.

(8) "Certificate of insurance" means a document certifying that the insurance required by chapter 67.42 RCW is in effect.

(9) "Operating permit" means a permit which is issued by the department.

(10) "Operating permit decal" is a decal issued by the department which shall be affixed on or adjacent to the control panel of the amusement ride or structure in a location visible to the patrons of the ride or structure.

[Statutory Authority: RCW 19.28.060. 88-16-002 (Order 88-15), § 296-403-010, filed 7/21/88. Statutory Authority: Chapter 67.42 RCW. 86-12-019 (Order 86-16), § 296-403-010, filed 5/28/86.]

**WAC 296-403-020 Insurance.** An original copy of the insurance policy in an amount not less than one million dollars per occurrence from an insurer authorized to do business in the state of Washington shall be filed with the department. The insurance company shall notify the department at least ten days prior to cancelling or revoking a policy and upon the nonrenewal of the policy. A certificate of insurance shall be filed with each sponsor, lessor, landowner, or other person responsible for an amusement ride being offered for use by the public. If the insurance company withdraws, cancels, revokes, suspends, or excludes coverage of any ride(s) from any policy furnished to the department, such withdrawal, cancellation, revocation, suspension, or exclusion shall be plainly stated in documents furnished to the department. The department shall be notified within twenty-four hours of the withdrawal, cancellation, revocation, suspension, or exclusion of insurance coverage of an amusement ride or structure for which an operating permit has been issued by the department.

[Statutory Authority: Chapter 67.42 RCW. 86-12-019 (Order 86-16), § 296-403-020, filed 5/28/86.]

**WAC 296-403-030 Application for operating permit.** (1) The applicant for an operating permit for an amusement structure or an amusement ride shall provide the following documents on forms approved by the department:

(a) The name, address and phone number of the owner or operator of the amusement ride or structure together with the name and signature of the applicant.

(b) Description of amusement structure or ride. Each amusement structure or ride shall be individually identified: (i) By a tradename or title and a narrative description from which the amusement structure or ride can be identified; and (ii) a serial number which is welded onto the frame or contained on an identification plate which is permanently affixed to the amusement structure or ride.

(c) Certificate of inspection. Each application shall have attached a certificate of inspection which shall certify that the ride or structure has been inspected for safety and meets the standards for insurance coverage. The signature of the inspector shall be notarized.

(d) The proper fee.

(2) Renewal of operating permit. An operating permit may be renewed prior to the expiration date by submitting an application with the proper fee and a certificate of mechanical safety inspection. The mechanical safety inspection shall have been performed within thirty days of the expiration date of the operating permit.

[Statutory Authority: Chapter 67.42 RCW. 86-12-019 (Order 86-16), § 296-403-030, filed 5/28/86.]

**WAC 296-403-040 Operating permit.** An amusement ride or structure shall not be operated unless the owner or operator has obtained from the department an operating permit and an operating permit decal. The operating permit decal shall be affixed on or adjacent to the control panel of the amusement ride or structure in a location visible to the patrons of the ride or structure. The owner or operator of the amusement ride or structure shall have available for inspection, at the location where the amusement ride or structure is to be operated, a copy of the operating permit for each amusement ride or structure. Each operating permit which has been issued to an owner or operator is valid for one year from the date of issue or the date of inspection whichever is less, unless revoked. The operating permit shall become null and void in the event that the insurance policy is cancelled or is no longer in effect or if an amusement ride or structure is materially rebuilt or materially modified so as to change the original action of the amusement ride or structure.

[Statutory Authority: Chapter 67.42 RCW. 86-12-019 (Order 86-16), § 296-403-040, filed 5/28/86.]

**WAC 296-403-050 Temporary operating permit.** A temporary operating permit for a period not to exceed fifteen calendar days may be issued by a department electrical inspector who is assured that the insurance policy required by chapter 67.42 RCW is on file with the department, that the safety inspection of the amusement ride or structure has been performed within the last year and that a proper application for an operating permit has been made.

[Statutory Authority: Chapter 67.42 RCW. 86-12-019 (Order 86-16), § 296-403-050, filed 5/28/86.]

**WAC 296-403-060 Fees.** The fee for issuing each operating permit and operating permit decal shall be ten dollars. All fees shall be deposited by the department in the electrical license fund.

[Statutory Authority: Chapter 67.42 RCW. 86-12-019 (Order 86-16), § 296-403-060, filed 5/28/86.]

**WAC 296-403-070 Appeals.** (1) A decision by the department in which; an operating permit has been denied or revoked; the department has ordered the cessation of the operation of an amusement ride or structure; an amusement ride inspector application has been denied, or certificate has been suspended or revoked, may be appealed to the electrical board. The appeal shall be conducted in accordance with chapter 34.04 RCW. An appeal shall not stay the decision of the department. The appeal shall be filed within fifteen days after notice of the decision of the department is given by certified mail, return receipt requested, or is served upon the owner or operator.

(2) A formal appeal shall be affected by filing a written notice of appeal with the department's chief electrical inspector and shall state the decision by the department that is being appealed and the relief that is desired. The formal appeal shall be accompanied by a certified check for two hundred dollars which shall be

returned to the holder of the certificate or permit if the decision of the department is not sustained by the board. If the board sustains the decision of the department, the two hundred dollars shall be applied by the department to the payment of the per diem and expenses of the members of the board incurred in the matter, and any balance remaining after payment of per diem and expenses shall be paid into the electrical license fund.

(3) An informal appeal shall be made in writing to the department chief electrical inspector and shall state the action by the department that is being appealed and the relief that is desired.

(4) See chapter 296-13 WAC for additional information on appeals before the electrical board.

[Statutory Authority: RCW 19.28.060, 88-16-002 (Order 88-15), § 296-403-070, filed 7/21/88. Statutory Authority: Chapter 67.42 RCW, 86-12-019 (Order 86-16), § 296-403-070, filed 5/28/86.]

**WAC 296-403-080 Amusement ride inspector qualifications.** An amusement ride inspector shall have the following minimum qualifications:

(1) Two years experience with an insurance company as an amusement ride inspector; or

(2) Two years experience inspecting amusement rides and enforcing amusement ride codes while employed by a state or governmental body regulating amusement rides; or

(3) Not less than five years documented field operating and maintenance experience with amusement rides and devices, including responsibility for erection, assembly, disassembly; personnel supervision responsibility for erection, maintenance, and operating functions; or

(4) Not less than ten years documented practical experience in the design, construction, maintenance, repair, field inspection, and operation of amusement rides and devices as an authorized representative of a recognized amusement ride manufacturer.

[Statutory Authority: Chapter 67.42 RCW, 86-24-071 (Order 86-16), § 296-403-080, filed 12/3/86.]

**WAC 296-403-090 Safety and maintenance seminar.** Every inspector shall annually attend at least one amusement ride safety and maintenance seminar sponsored by the American Recreational Equipment Association or an equivalent approved by the department. All experience and schooling shall be documented and verified which shall be furnished to the department with an application for an amusement ride inspector certificate.

[Statutory Authority: Chapter 67.42 RCW, 86-24-071 (Order 86-16), § 296-403-090, filed 12/3/86.]

**WAC 296-403-100 On-site examination.** All applicants, after payment of fees and after being deemed qualified by experience will be required to pass an on-site inspection of a minimum of at least six rides of which no two may be the same. This on-site inspection will be supervised by the electrical inspection section and each applicant will be evaluated on his general knowledge of the field and specific criteria. If the applicant fails, the applicant may reapply in six months.

[Statutory Authority: Chapter 67.42 RCW, 86-24-071 (Order 86-16), § 296-403-100, filed 12/3/86.]

**WAC 296-403-110 On-site examination content.** The on-site inspection examination will include, at a minimum, the applicant's familiarity with: Proper blocking; main bearings and bearings or bushings on each passenger container; main drive unit alignment and excess wear; entire ride lubrication and excess lubrication; proper ride R.P.M.; braking surfaces condition and effectiveness; emergency stop procedures; structural defects, broken bolts, cracked welds, etc.; missing and proper size pins and proper keys; guys, anti-sway devices, cable placement and proper tension; bolts (correct grade); alignment; operation at full R.P.M.; operator control during normal operating hours with normal crowds; machinery for proper guards; points of wear for excess wear; manufacturer's maintenance manual for specific rides and manufacturer recommended points of critical inspection; entrance, egress, and public areas for oil, broken boards, hand rails and safety restraints for waiting riders; entrance and exit sharp edges, torn metal, and exposed parts that a passenger could encounter; tubs, chairs, seats, containers, for exposed dangerous edges, safety restraints, condition of safety webbing, latches, hinges, worn parts, proper alignment of bars, doors, latches; rider operated controls; all cars, tubs or chair bushing, suspension, shocks, safety chains, safety cables; car tub or chair worn or loose bushings; exits to determine if exits could be entered or if proper restraints are in place; all electrical boxes locked; all rides have an equipment grounding conductor extending from ride back to main power source; main power properly grounded and fused; insulation on all power cords; proper fusing on branch circuits according to wire size; all splices for bare conductors and proper insulation; all cords on rides for condition, plugs and cord bodies; light fixtures secured; light fixtures for wiring methods; articulated items for wiring deficiencies, slip rings, and such other aspects and conditions as are set out in manufacturers specifications and technical data; requirements under the National Electrical Code or chapter 296-46 WAC for amusement rides and devices; rider or devices which are substantially altered, or for which manufacturer's data is not available.

[Statutory Authority: Chapter 67.42 RCW, 86-24-071 (Order 86-16), § 296-403-110, filed 12/3/86.]

**WAC 296-403-120 Reciprocal certificate.** The department may upon proper application, issue an amusement ride inspector certificate to an individual who meets the minimum qualifications as set forth in this chapter and who possesses a current, valid amusement ride inspector certificate in a state or province which has equal or higher standards for amusement ride inspectors as those contained in this chapter. No amusement ride inspection examination will be required of those persons who qualify for a reciprocal amusement ride inspector certificate.

[Statutory Authority: Chapter 67.42 RCW, 86-24-071 (Order 86-16), § 296-403-120, filed 12/3/86.]

**WAC 296-403-130 Insurance company amusement ride inspector.** An insurance company amusement ride inspector may inspect only amusement rides or devices insured or to be insured by his or her employer or principle. The amusement ride inspector who is inspecting an amusement ride or device which is, or is to be insured by his or her employer, is exempt from the minimum qualifications and on-site inspection examination of this chapter.

[Statutory Authority: Chapter 67.42 RCW. 86-24-071 (Order 86-16), § 296-403-130, filed 12/3/86.]

**WAC 296-403-140 Revocation of certification of amusement ride inspectors--Reinstatement.** (1) An amusement ride inspector's certificate of competency may be suspended or revoked for any cause such as certifying the safety of an unsafe ride, falsifying records or reports or certifying an amusement ride or structure which he or she has not personally inspected.

(2) No certificate of competency shall be suspended or revoked until after a hearing has been held before the department. The inspector and his employer are entitled to appear at such hearings and to be heard.

(3) The department of labor and industries shall deliver to both the inspector charged and to his employer, not less than ten days prior to the hearing, a written notice of the charges and of the time and place of such hearing.

(4) An inspector whose certificate of competency has been suspended or revoked may apply for the reinstatement thereof not less than ninety days after the time of revocation.

[Statutory Authority: Chapter 67.42 RCW. 86-24-071 (Order 86-16), § 296-403-140, filed 12/3/86.]

**WAC 296-403-150 Fees for examination, certification, and renewal of certification for inspectors.** (1) Fee for each application for inspector's certificate of competency and examination . . . . . \$100  
(2) Application fee (nonrefundable) . . . . . \$ 20  
(3) Fee for annual renewal of certificate of competency, reciprocal inspector certificate, or for insurance company inspector certificate . . . . . \$ 20

[Statutory Authority: Chapter 67.42 RCW. 86-24-071 (Order 86-16), § 296-403-150, filed 12/3/86.]